

MKS Product Guide



MKS Inc. enables technologies that transform our world. We deliver foundational technology solutions to leading edge semiconductor manufacturing, advanced electronics and specialty industrial applications. We apply our broad science and engineering capabilities to create instruments, subsystems, systems, and process control solutions 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 and feature enhancement for optimized connectivity. Our solutions are also critical to addressing ever-increasing performance requirements across a wide array of specialty industrial applications.

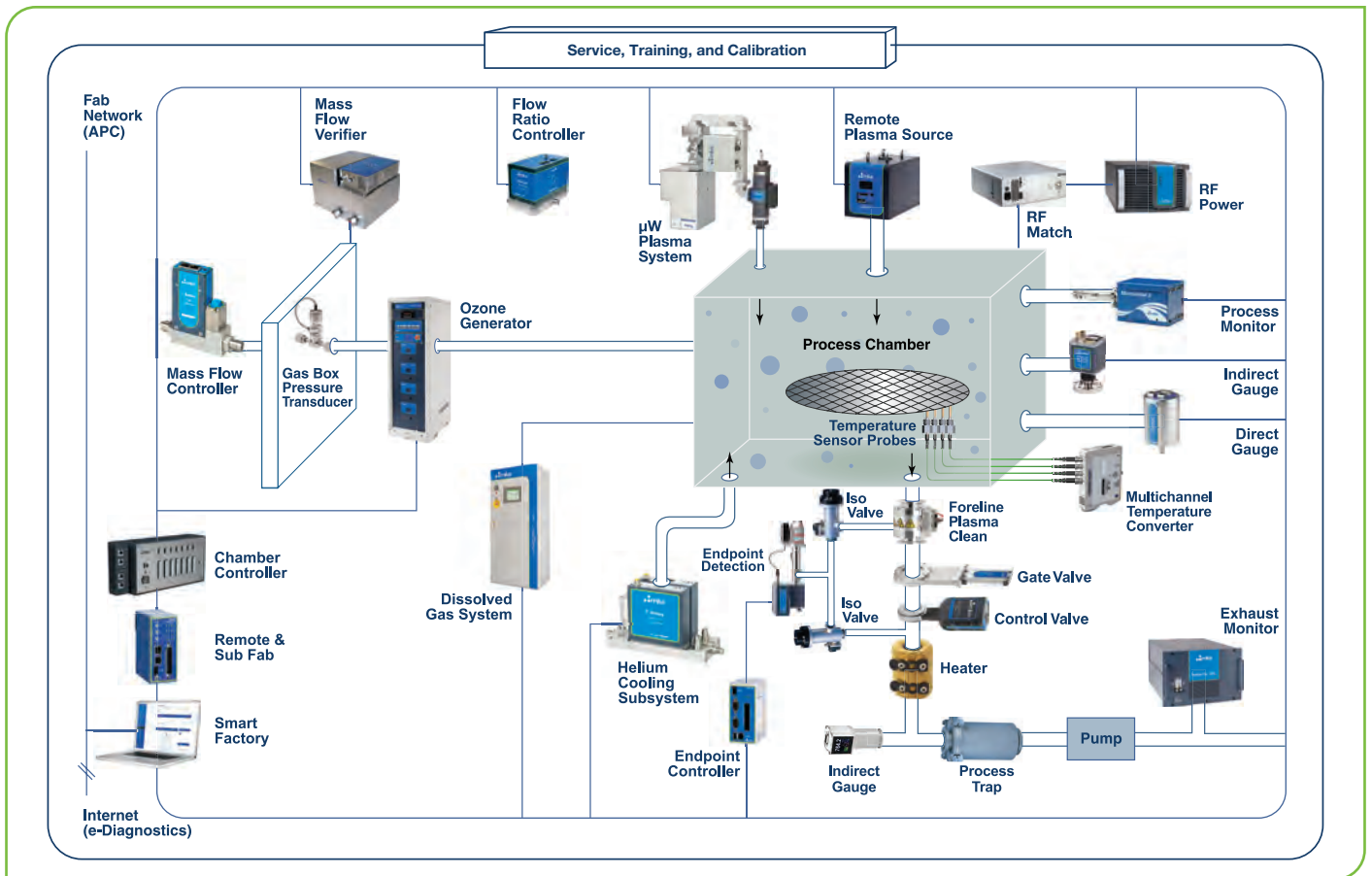
Products

- Automation, Control & Sensing
- Capacitance Manometers
- Gas Analyzers
- Heater Jackets
- Mass Flow Controllers & Meters
- Plasma & Reactive Gas Solutions
- Pressure Controllers & Valves
- RF & Microwave Generators
- Vacuum Flanges & Fittings
- Vacuum Gauges

Surround the Wafer®

MKS' Surround the Wafer® offering provides semiconductor customers with a wide range of products, design and development services, system level integration, training programs, calibration, service, and repair. This unique

combination of products and services enables our customers to solve the challenges of ultra-thin layers, new materials and complex 3D structures while maintaining quality and productivity levels.



Automation, Control & Sensing Solutions

MKS provides customized automation and control solutions to leading tool manufacturers in Semiconductor, Life Sciences, and other Advanced Markets. Our innovative team will design a robust solution to meet your form, fit, and function requirements. Based on cutting edge platforms, leveraging future technology and long-term tested building blocks, the solutions we provide have the highest levels of quality and reliability.

Our Sensing Solution combines a fiber optic probe with a single or multichannel temperature converter providing increased flexibility and ease of use. MKS' Fiber Optic Temperature Sensor, designed specifically to perform under conditions where traditional electrical sensors fail, achieves the highest measurement accuracy and repeatability over a wide temperature range for plasma-assisted semiconductor process such as deposition and etch.



MicroNode™ Compact Networked I/O

- Mixture of digital and analog I/O makes selection of a cost-effective product easy
- Package design and options makes installation flexible
- IP61 rated for use in harsh industrial environments
- EtherCAT and DeviceNet communication interfaces
- High EMC, ESD noise immunity and isolation for demanding industrial applications



Modular I/O Controller Platform

- Modular, scalable architecture with flexible digital and analog I/O via interchangeable "slice" design
- Expandable with remote I/O units for distributed system layouts
- High-performance I/O control with real-time EtherCAT communication
- Integrated safety support with certified Safety Digital I/O (SIL3 / PLe / Cat. 4)



Fiber Optic Temperature Sensors

- 1 - 5 channels
- Supports Modbus, Analog, or EtherCAT communication
- Analog output 4 - 20mA (16-bit DAC)
- Systems do not require recalibration

Capacitance Manometers

MKS Baratron® capacitance manometers are highly accurate and repeatable, insensitive to gas composition, compact, and easily interfaced with most process tools. We manufacture our diaphragm gauges almost exclusively using nickel-based alloys such as Inconel®, Incoloy® and others. This makes them highly resistant to corrosion when the materials are matched

to the process. Our sensors are fully welded and 100% leak-checked prior to assembly. In the event of an extremely rare failure of the diaphragm, the process gases are completely contained within the sensor, preventing escape to the outside environment. No other pressure or vacuum gauge offers that level of safety.



226B All-purpose Differential Pressure Transducer

- 26 to 1.33×10^5 Pa, 0.2 - 1000 Torr Full Scale range
- 0.3% or 0.5% of Full Scale accuracy or 0.3% of reading option for unidirectional calibration
- Unidirectional or bidirectional calibration
- 140 kPa, 1050 Torr overpressure limit



626D Unheated Absolute Pressure Transducer

- 1.33×10^1 to 1.33×10^5 Pa, 0.1 to 1000 Torr Full Scale range
- 0.25% to 0.50% accuracy of Reading
- 45 psia (310 kPa) overpressure limit
- Input Voltage: ± 15 VDC



627H Heated Absolute Pressure Transducer

- 2.67 to 3.33×10^6 Pa, 0.02 to 25,000 Torr Full Scale range
- 0.12% or 0.15% accuracy of Reading
- 45 psia (310 kPa) or 120% of Full Scale overpressure limit, whichever is greater
- 45°C temperature control



631F Heated Absolute Pressure Transducer

- 1.33×10^2 to 1.33×10^5 Pa, 1 to 1000 Torr Full Scale range
- 0.50% accuracy of Reading
- 150°C, 200°C internally heated temperature
- Uses: LPVCD, freeze drying etc.

Capacitance Manometers



722C Compact All-purpose Absolute Pressure Transducer

- 1.33×10^2 to 3.33×10^6 Pa, 1 to 25,000 Torr Full Scale range
- 0.50% accuracy of Reading
- 310 kPa, 2325 Torr overpressure limit
- Signal output: 0 - 10 VDC or 0 - 5 VDC



AA07B Gas Supply Pressure Transducer

- 1.33×10^5 to 2×10^7 Pa, 1000 Torr to 3000 psia Full Scale range
- 1% accuracy of Reading
- 13 - 32 VDC @ 10 mA max input power



DA05A and DA07A Absolute Baratron® Digital Capacitance Manometers

- DA05A: Full Scale pressure $< 1.33 \times 10^2$ Pa, < 1 Torr and heated to 45°C, 80°C, and 100°C
- DA07A: Full Scale pressure 1.33×10^2 to 1.33×10^5 Pa, from 1 - 1000 Torr and unheated or heated to 45°C, 80°C, and 100°C
- Includes both analog output and EtherCAT communications
- Standard or etch/fluorine/deposition friendly sensor options available



PR4000B Digital Power Supply / Readout

- Power Supply: ± 15 VDC @ 1.5 Amps; 24 Volts @ 1 Amp
- RS232 standard, RS485 optional for dual-channel

Gas Analyzers (Mass Spectrometers)

Our wide range of powerful, versatile, and proven mass spectrometry-based solutions deliver a new level of understanding and control in vacuum and gas-related applications.



Cirrus™ 3-XD Atmospheric Gas Analyzer

- Benchtop or rack-mount gas analysis system
- Detection at ppb to % level
- 250 data points per second
- Ethernet communication



HPQ3 High-Pressure Residual Gas Analyzer

- 0.13 Pa, 0.001 Torr maximum operating pressure
- 1-100 amu mass range
- Ethernet communication
- Fully-automated in-situ process monitoring possible



Microvision 2 Smart Head Quadrupole Mass Spectrometer

- <3 ms per point analog scanning speed
- Complete range of additional digital and analog connections
- Pollution-resistant double filter

Gas Analyzers (Mass Spectrometers)



Vision 2000-A Residual Gas Analyzer for ALD & CVD Processes

- $<2.7e-10$ Pa, $<2e-12$ Torr minimum detectable partial pressure
- Modular UniBloc inlet with all metal seals and field serviceable parts
- Temperature inlet up to 200°C (consult the factory for models up to 300°C)
- Direct coupling for a sample transfer tube



Vision 2000-C™ & Vision 2000-E™ Residual Gas Analyzers for Multi-pressure, CVD & ALD Processes

- $<2.7e-9$ Pa, $<2e-11$ Torr minimum detectable partial pressure
- Continuous in situ monitoring
- Baseline monitoring for air leaks and background contamination
- Remote Vacuum Controller (RVC) for failsafe vacuum operation



Vision 2000-P™ Residual Gas Analyzers for Select Pressure & PVD Processes

- <100 ppb for most common gases
- Track process gas mixture composition when two gases are utilized
- Vacuum troubleshooting for fast PM recovery

Gas Analyzers (FTIR/TFS™)

FTIR Spectroscopy gas analyzer instruments from MKS are capable of ppb to ppm sensitivity for multiple gas species in a variety of gas analysis applications, such as toxic gas detection, automotive emissions measurement, and monitoring stack emissions, processes, ambient air, purity, and selective catalytic reduction performance.

MKS' platform of innovative optical analyzers based on Tunable Filter Spectroscopy (TFS™) provides real-time gas analysis, while delivering customers a substantially lower total cost of ownership. TFS can be utilized from UV (Ultra-Violet) through IR (Infra-Red) spectral regions.



AIRGARD® Ambient Air Analyzer

- FTIR (infrared spectroscopy) has compact design with wide measurement wavelength range
- Single digit parts per billion detection
- Less than 20 seconds response time
- Library of 375 harmful substance/gases



MultiGas™ 2030 FTIR Gas Analyzer

- Fully-automated gas analyzer that can directly read concentration levels
- Able to detect multiple gas 1-10 ppm level even among exhaust gas flows
- 5 Hz sampling
- Capable of transient phenomena monitoring



Precisive® Gas Analyzer

- No carrier gas or fuel gas requirements
- Hazardous area certified
- Drift doesn't exceed 0.2% per month

Heater Jackets

Our heater jackets are designed for use on stainless steel tubing and components. These cleanroom-compatible, CE compliant jackets are made with a unique molded design for proper fit and easy installation. Materials

ensure consistent and uniform heating where the heater jacket comes in contact with the piping, while maintaining a safe, "warm to touch" temperature on the outside of the jacket.



Series 48 Single-Use Filter

- Molding specification heater for vacuum pipes
- 40°C to 100°C temperature set point range
- CE, UL, Semi S2, and Nema 4x compliant
- Equipped with temperature controller



Series 49UL Thermal Management System

- Polyimide or Teflon® heater jacket
- Local LED status display
- Low particulate generation and low VOC
- 25°C to 200°C temperature range

Mass Flow Controllers & Meters

Mass flow controllers and meters are available in thermal and pressure based sensor technologies, analog and digital communication, and metal or elastomer seals. Enabling our customers to bring their products and

processes to market faster, more reliably, and more cost effectively is at the heart of our flow measurement and control product design philosophy.



C-Series Compact Mass Flow Controllers

- Full Scale flow 15 sccm to 50,000 sccm (N₂ equivalent)
- Ultrafast response time of <100 msec
- ±0.8% set point accuracy
- Minimal zero and span drift assure long term reproducibility



G-Series Mass Flow Controllers

- Full Scale flow 5 sccm to 300 slm (N₂ equivalent)
- EtherCAT, DeviceNet, Profibus®, Profinet®, RS485, or analog communication available
- Elastomer and metal-sealed
- 4-20 mA communication



High Flow Mass Flow Controllers

- Full Scale flow 500 slm to 1000 slm (N₂ equivalent)
- Valve plug options of Viton®, Buna, Neoprene® or EPDM
- Analog, RS485, Profibus, Profinet or DeviceNet I/O communication available
- Standard closed conductance leak rate of less than 1.0% of Full Scale



P-Series High Performance Mass Flow Controllers

- Full Scale flow 5 sccm to 50,000 sccm (N₂ equivalent)
- Metal seal
- Analog, DeviceNet or EtherCAT communication available
- Multi-gas/Multi-range with 1% set point accuracy

Flow Ratio Controllers and Flow Verifiers



Delta™ Flow Ratio Controller

- Full Scale flow 500 sccm to 10000 sccm
- Separates mixed gas at the desired ratio
- Available with 2, 3 or 4-zone flow ratio control
- Analog, EtherCAT or DeviceNet communications



High Precision Mass Flow Verifier

- Verifies MFC flow in situ
- Measurement range 5 to 3000 sccm
- Process matching between wafers, chambers or seals with a measurement precision of 1.0% or more

Plasma & Reactive Gas Solutions

IC architectures and new materials require innovation in materials processing. MKS delivers leading edge technology to improve productivity and process

repeatability for deposition, etch and wet clean processes with Remote Plasma Sources, Ozone Generation and Dissolved Gases.



CM12P1 Remote Plasma Source for ALD, CVD, and PVD Chambers

- Compact design enables easy integration to OEM process chambers
- 12 kW output power
- $\pm 1\%$ to power set point accuracy
- EtherCAT or Analog DB25 communication



CH24P1 Remote Plasma Source For High Flow Applications

- Compact split applicator power design provides easy integration to OEM process chambers
- 24 kW output power
- $\pm 1\%$ to power set point accuracy
- EtherCAT or Analog DB25 communication



Paragon® Remote Plasma Source

- 8 slm NF_3 flows
- $> 95\%$ NF_3 dissociation
- Compatible with O_2 and NF_3 mixed gases



Revolution® Remote Plasma Source

- Up to 10 slm oxygen radicals
- Plasma power up to 6kW
- EtherCAT or analog communication

Plasma & Reactive Gas Solutions



LIQUOZON® Dissolved Gas System

- 30 - 90 ppm ozone concentration
- 2 - 140 lpm flow rate
- Analog and digital bidirectional communication with remote control



Ozone Gas Delivery System

- 350g/Nm³ minimum ozone output
- Models available with up to 4 channels
- Oxygen or nitrogen feed gas
- System options include safety monitoring, status indicators and ozone destruction capability

Pressure Controllers & Valves

Our innovative solutions for vacuum pressure control are backed by our relentless focus on operational excellence to ensure your success by improving the productivity of vacuum processes.



GPCA General Purpose Pressure Controller

- 6.66×10^4 to 6.9×10^5 Pa, 500 Torr to 100 psia Full Scale range
- Full Scale flow 50 sccm to 50,000 sccm (N_2 equivalent)
- 316 S.S., Teflon, KM45 and Elgiloy[®] wetted materials
- 4 VCR[®] male, 1.125" Surface Mount (C-seal, W-seal), 1/4" Swagelok fittings



GPCMA General Purpose Pressure Controller with Mass Flow Meter

- 6.66×10^4 to 6.9×10^5 Pa, 500 Torr to 100 psia Full Scale range
- Full Scale flow metering 5 sccm to 50,000 sccm (N_2 equivalent)
- 316 S.S., Teflon, KM45 and Elgiloy[®] wetted materials
- 4 VCR male, 1.125" Surface Mount (C-seal, W-seal), 1/4" Swagelok fittings



PPCA High Performance Pressure Control Valve with Integrated Controller

- 1.33×10^3 to 1.33×10^5 Pa, 10 to 1000 Torr Full Scale range
- Full Scale flow 50 sccm to 50,000 sccm (N_2 equivalent)
- Teflon, Viton, Buna-N, Neoprene, EPDM valve seat
- 4 VCR male fittings, 1.5" wide body Surface Mount (C-seal)



PPCMA High Performance Downstream Pressure Controller with Mass Flow Meter

- 0.66 to 1.33×10^5 Pa, 0 to 1000 Torr Full Scale range
- Full Scale flow metering 5 sccm to 5000 sccm (N_2 equivalent)
- Teflon, Viton, Buna-N, Neoprene, EPDM valve seat
- 4 VCR male fittings, 1.5" wide body Surface Mount (C-seal)

Pressure Controllers & Valves



148JA All Metal-sealed Control Valve

- 10 sccm to 30 slm Full Scale range
- 316 S.S., Nickel, Teflon, KM45 and Elgiloy® wetted materials
- 150°C bake out temperature
- 4 VCR male fittings



248D Elastomer-sealed Control Valve

- 10 sccm to 50,000 sccm Full Scale range
- 316 S.S., Nickel, Viton standard wetted materials
- 60°C bake out temperature
- ¼" Swagelok® standard fitting; 4 VCR or 4 VCO® optional



T2BA Exhaust Throttle Valve

- 0.25% of set point accuracy or 5 mV (whichever is greater)
- KF25, KF40, KF50, NW63, NW80, NW100 and NW160 valve bore and flange size. Additional sizes available.
- Heatable valve body (105°C standard, 150°C and 200°C optional)
- EtherCAT, RS232, RS485, DeviceNet, and Analog TTL communication



Vacuum Valves

- Various vacuum valves according to the usage, including compact bellows valve, self-heating valve, and a 2-stage valve for which soft start is possible

RF & Microwave Generators

MKS offers high reliability, compact, solid state, RF power generators and microwave generators and systems. Our generators, combined with our Impedance Matching Network and our V/I Probe form a complete RF Delivery System.



elite™ RF Plasma Power

- 13.56 MHz frequency
- >85% power efficiency DC to RF
- $\pm 2\%$ RF power output accuracy
- Half-rack enclosure enables direct tool mounting



Keinos RF Generator

- 2 MHz frequency
- 5 kW, 11 kW, 13 kW output power
- Up to 50 KHz pulse frequency for advanced process requirements
- Forward power accuracy of $\leq \pm 1.0\%$ of set point



SmartPower® Microwave Power/Plasma Source Generator

- 1.8 kW and 3 kW output power
- 1% output power ripple
- Supports 200mm and 300mm applications

Vacuum Flanges & Fittings

We offer ISO-KF, ISO-MF, ISO-BF, CF (ConFlat®), and welded style vacuum fittings, vacuum flanges and vacuum components including elbows, reducers, tees, crosses, viewports, seals, adapters, clamps, hoses, flanges, tubes and tubing, and gaskets.



Series 23 Buttweld Vacuum Components

- Designed to be used in conjunction with our full line of ISO-MF, ISO-KF and CF UHV flanges
- Easily welded to the flanges or each other during on-site installation
- Made of 304 stainless steel
- Specifically prepared for use in high vacuum process or UHV applications.



Series 31 ISO-KF Vacuum Flange Components

- Made with quality stainless steel materials
- Available in sizes NW ISO 10 to NW ISO 50
- Custom manifolds and flanges available
- High temperature O-rings available



Series 76 ISO-MF and ISO-BF Vacuum Flange Components

- Quick operating modular system for vacuum construction with flanging ranging from 2.5 to 24 inches (NW63 to NW630)
- More compact than ASA flanges
- Sexless flange



Series 88 CF UHV Flange Components and Fittings

- Standard for ultrahigh vacuum (UHV) applications
- Made with very high purity stainless steel
- Available sizes from mini 1-1/3 to 4-5/8 inches

Vacuum Gauges: Cold Cathode Transducers and System Controller

MKS offers a wide range of cold cathode products. The 970B Series is a family of compact, low cost, general-purpose transducers that utilize from one to three sensors — cold cathode, MicroPirani™ and Piezo technologies. Combining these sensing technologies enables a wide measurement range from 10^{-6} Pa to atmosphere. In addition to its small size, broad range and lower cost, the 970B Series can

be operated via digital communication or as an autonomous analog unit. The family comprises of three transducer models, the 971B UniMag™ (cold cathode), 972B DualMag™ MicroPirani/cold cathode) and the 974B QuadMag™ (Piezo/MicroPirani/cold cathode). Options include a local display and set point relays.



Series 970B Cold Cathode Transducer Family

- Wide measurement range 1.33×10^{-6} Pa, 1×10^{-8} Torr to atmosphere
- Low CCG turn on pressure (6.66×10^{-2} Pa, 5×10^{-4} Torr) for longer lifetime
- All transducers include both analog and digital communication for ease of operation



Series PDR900 Controller

- Single channel controller for use with 900 Series transducers
- LCD menu display for easy user interface
- Easy to read 5 digit LED display
- Three high power set point relays for process control

Vacuum Gauges: Combination Gauge/System Controllers

MKS offers highly flexible vacuum gauge controllers that enable a wide range of gauging technologies, tailoring the system to each individual application. These versatile vacuum controllers provide power and simultaneous

readouts for up to six different vacuum gauges and/or mass flow controllers, with options for controlling pressure, calibration, and system diagnostics.



Series 937B Digital Combination Vacuum Gauge System

- 1×10^{-9} to 2.7×10^6 Pa, 1×10^{-11} to 20,000 Torr measurement range
- Simultaneous control and readout of up to six sensors and gauges
- User-configurable for units of pressure in Torr, millibar, Pascal, or microns
- RS232, RS485, and Profibus (optional) communication



Series 946 Vacuum System Controller

- Simultaneous control and readout for up to six vacuum gauges and/or six mass flow controllers
- Provides pressure measurement, flow, valve, and pressure control
- Closed-loop pressure control option for use with MKS valves eliminates the need for separate pressure control electronics
- RS232 and RS485 communication

Vacuum Gauges: Micro-Ion® Gauges and Spinning Rotor Gauge

The Micro-Ion® gauge is the world's smallest B-A style gauge in an all-metal, rugged enclosure. Micro-Ion gauges are compact, reliable, cost-effective, and measure a wide range of vacuum pressure. Micro-Ion modules are available with dozens of different options and capabilities to meet any need for accurate pressure measurement from 10^{-7} Pa to atmosphere.

The Spinning Rotor Gauge (SRG) line is a high-vacuum gauge that operates by measuring the amount of viscous drag on a magnetically-levitated spinning ball, which is directly related to the number of molecules in the chamber. The SRG is an industry calibration standard, often used in a metrology department.



Series 355, 392, 390 Micro-Ion® Modules and Transducers

- **Series 355:** Micro-Ion transducer provides vacuum pressure measurement from 1.33×10^{-7} to 6.66 Pa, 1×10^{-9} to 5×10^{-2} Torr
- **Series 392:** Combines Micro-Ion and Conductron sensors to provide measurement from 1.33×10^{-7} Pa, 1×10^{-9} Torr to atmosphere
- **Series 390:** Combines Micro-Ion, Conductron and Piezo resistive sensors to provide measurement from 1.33×10^{-7} Pa, 1×10^{-9} Torr to atmosphere, along with gas independent atmospheric pressure indication



Spinning Rotor Gauge System (SRG3-EL)

- 5×10^{-5} to 100 Pa, 5×10^{-7} to 0.75 Torr measurement range
- Transfer standard for vacuum measurement
- Insensitive to ionization effects from other vacuum gauges
- Up to 1 Pa, 7.5×10^{-3} Torr: 1% of measuring value + U
1 to 100 Pa, 7.5×10^{-3} to 0.75 Torr: increasing up to 10% of measured value (typical)

Vacuum Gauges: Mini-Convectron®, Convectron® Gauges, Controllers and Transducers

Convectron® gauges have been the world-standard convection-enhanced pirani gauge for over three decades and are used in thousands of vacuum processes to accurately measure pressure from 10^{-2} Pa to atmosphere. Every Convectron gauge is individually calibrated before shipping from the factory. The Series 475 Convectron gauge controller incorporates the latest technological

advances in electronics and design. Mini-Convectron® modules combine the Convectron gauge with electronics in a compact modular design and are available with dozens of different options and capabilities to meet any need for accurate pressure measurement from 10^{-1} Pa to atmosphere.



Series 275 Mini-Convectron® Transducers

- 1.33×10^{-2} Pa, 1×10^{-4} Torr to atmosphere
- Compact, rugged, RF and noise-immune module
- 150°C maximum bake out temperature
- RS485 and DeviceNet communication



Series 275 Convectron® Vacuum Gauge

- 1.33×10^{-2} Pa, 1×10^{-4} Torr to atmosphere
- Easy installation in space-restricted locations
- Millisecond response time



Series 475 Convectron® Gauge Controller

- 1.33×10^{-2} Pa, 1×10^{-4} Torr to atmosphere
- 1.33×10^2 , 1 Torr resolution at atmosphere
- N_2 , Ar, He, CO_2 and O_2 selectable gas curves
- RS232 and optional RS485 communication

Vacuum Gauges: MicroPirani™ and Piezo Transducers

The Series 900 vacuum transducers are microprocessor-based, stand-alone gauges that offer ultra compact design and a wide pressure measurement range. Designed for system integration, the Series 900 transducers offer both analog and digital communication and incorporate

MEMS-based (Micro Electro-Mechanical Systems) technologies including MicroPirani™ and Piezo sensors. These transducers are mountable in any orientation without loss of accuracy for ease of installation.



Series 901P MicroPirani™/Piezo Loadlock Transducer

- Accurate absolute measurement from 1.33×10^{-3} to 1.99×10^5 Pa, 1×10^{-5} to 1500 Torr gas independent
- 100 msec maximum relay response
- EtherCAT, RS232 or RS485 and analog communication



Series 902B Absolute Piezo Transducer

- 1.33×10^1 to 1.33×10^5 , 0.1 to 1000 Torr Full Scale measurement range
- 100 msec maximum relay response
- Suitable for harsh processes
- RS232, RS485, EtherCAT and Analog communication



Series 910 DualTrans™ MicroPirani™/Absolute Piezo Transducer

- 1.33×10^{-3} to 1.99×10^5 Pa, 1×10^{-5} to 1,500 Torr absolute pressure measurement range
- 85°C maximum, non operating bake out temperature
- Calibration gases include Air, Argon, Helium, Nitrogen, H₂, H₂O vapor, CO₂, Xenon, Neon



Series 925 MicroPirani™ Transducer

- 1.33×10^{-3} Pa, 1×10^{-5} Torr to atmosphere
- High accuracy for improved process control
- Pre-programmed gas curves for N₂, Ar, He, H₂, H₂O, Xe and CO₂
- EtherCAT, RS232 or RS485 and analog user interfaces

Support and Service

Application Team & Technical Support

Our application labs, staffed with a team of technical experts and MKS-certified test equipment, provide expertise and support in our served applications. With extensive Semiconductor process knowledge in deposition and removal of thin films, patterning of complex architectures, inspection and clean, we provide application support to ensure our customers achieve optimal processing for complex and demanding applications. Our application team also provides critical guidance to our internal product development groups.

Our technical support team provides comprehensive technical support for our products. With experts around the globe, we are staffed to support your installation, set-up, trouble shooting and production inquiries 24 hours, 7 days per week.

Engineering Development

MKS works closely with our customers to develop specific products and solutions to solve their complex problems. We will develop custom solutions based on the customer's specification. We also collaborate with our customers by providing engineering and development.

Training Programs

Leveraging our extensive in-house product knowledge and semiconductor processing expertise, we can provide intensive in-house and on-site training for critical subcomponents. Using detailed technical information and demonstration equipment, we tailor training to ensure it's interesting and relevant for your needs. Custom training may also be available.

Calibration

We offer calibration on our valves, pressure sensors, mass flow controllers, Spectra-Physics® lasers, and Newport™ and Ophir® power meters. Calibration is done on MKS-certified test equipment at our Service Centers around the world.

Repair

Our Service Centers are staffed by highly-skilled engineers and technicians expert at diagnosing and repairing MKS products. We offer comprehensive repair and service programs that maximize the installed base of critical subcomponents to ensure extended life of your equipment, increased uptime and tool availability, improved predictability and productivity.

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



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MKS Inc. (NASDAQ: MKSI) 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.

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