

ETHERCAT® PRODUCT SELECTION GUIDE

NEW STANDARDS IN PERFORMANCE & FLEXIBILITY



AUTOMATION & CONTROL



ETG.5003.1



**MicroNode™ Combo
Programmable Automation
Controller**

- Each MicroNode module supports 16 DIO
- Each module supports 16-bit, 8 analog inputs, 4 analog outputs, ±10V

**Custom Automation
I/O Controller**

- Customizable architecture allows for expansion, customization, and modularity
- Remote boxes can add I/O connections in remote locations
- Supports hardwired safety interlocks or software programmable safety interlocks (TUV SIL3)

FLOW/GAS DELIVERY



ETG.5003.2020



ETG.5003.2025



ETG.5003.2025



ETG.5003.2025

**G Series
Mass Flow Controllers and
Meters**

- Full Scale flow rates from 5 sccm to 300 slm
- Proven, patented thermal sensor and mechanical design
- Multi-range/multi-gas capability; 1% of set point accuracy

**G Series
Pressure Controllers**

- Pressure control for Full Scale from 500 Torr to 100 psia
- Thermally stable pressure sensor for 1% of set point accuracy
- Digital flow control algorithm for fast response to set point

**P Series
Pressure Controllers**

- Pressure control for Full Scale from 10 to 1000 Torr
- Thermally stable pressure sensor for 1% of set point accuracy
- Flow meter option for backside wafer pressure control applications

**P Series
Dual Zone Pressure Controller**

- Pressure control for Full Scale for 20, 50 or 100 Torr
- Integrated mass flow meter
- Full Scale flow measurement range for 20, 50, 100 sccm

FLOW/GAS DELIVERY



Delta™

Flow Ratio Controllers

- Accurate and repeatable flow ratio control for better process optimization
- For use in cascade configurations
- Operates to temperatures up to 60°C ambient

HA-MFV

High Accuracy In-Situ Mass Flow Verifier

- Flow rates up to 3000 sccm
- External volume insensitivity
- Reading measurement accuracy of 1.0% or better



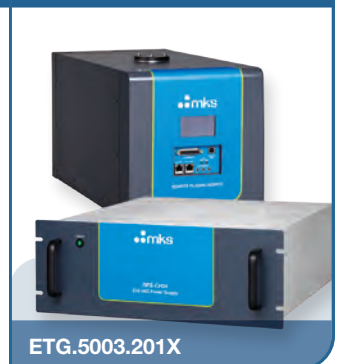
ETG.5003.201X



ETG.5003.201X



ETG.5003.201X



ETG.5003.201X

Paragon®

Remote Plasma Sources

- For high gas dissociation rates (>98%) of NF₃
- Gas flows up to 8 slm and pressures up to 10 Torr
- Compatible with O₂ and NF₃ mixed gases

R*evolution®

Remote Plasma Sources

- Up to 6kW of plasma power
- Integrated, self-contained unit for on-chamber installation
- Quartz plasma applicator, high density for oxygen species

CM12P1

Remote Plasma Source

- 12kW of plasma power
- Compatible with NF₃, O₂, N₂, and Ar
- Meets Semi F47 immunity response requirements

CH24P1

Remote Plasma Source

- 24kW of plasma power
- Supports high flow applications
- Split power train for flexible installation

PRESSURE/VACUUM MEASUREMENT



ETG.5003.2080

901P
Load Lock Transducer

- Designed specifically for semiconductor load lock applications
- Providing medium vacuum measurement and atmospheric switching
- Fast and accurate pressure measurement for improved cycle time and particle reduction



ETG.5003.2080

902B
Vacuum Transducer

- 1000 Torr Full Scale range
- Piezo resistive diaphragm sensor
- Stainless steel diaphragm



ETG.5003.2080

925 MicroPirani™
Vacuum Transducer

- MEMS-based technologies, including MicroPirani™ technology
- Applicable for foreline and general vacuum measurement applications
- Fast and accurate pressure measurement



ETG.5003.2080

972B DualMag™
Cold Cathode Transducer

- Single transducer with wide pressure measurement range from atmosphere to ultra-high vacuum
- MEMS-based MicroPirani technology combined with cold cathode ionization technology
- Small footprint design

PRESSURE/VACUUM MEASUREMENT



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DA03B
Baratron® Capacitance Manometer

- Heated at 150°C to 200°C
- Optional internally-mounted solid state process relays
- Compact design



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DA05A
Baratron® Capacitance Manometer

- Ambient operating temperature at 60°C
- 0.1 and 0.25 Torr Full Scale ranges
- Standard sensor or etch/fluorine/deposition-friendly sensor option



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DA06A
Baratron® Capacitance Manometer

- Heated at 45°C, 80°C, 100°C
- 1 Torr to 1 mTorr Full Scale ranges
- Standard sensor or fluorine/deposition-friendly sensor option



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DA07A
Baratron® Capacitance Manometer

- Unheated or heated at 45°C, 80°C, 100°C
- 1 Torr to 1000 Torr Full Scale ranges
- Standard sensor or etch/fluorine/deposition-friendly sensor option

PRESSURE/VACUUM MEASUREMENT



ETG.5003.2080



ETG.5003.2080

390 Micro-Ion® Vacuum Transducer

- Combined Micro-Ion® ionization gauge technology, Conductron heat loss sensor, and 2 Piezo resistive sensors
- Continuous pressure measurement from high vacuum to atmosphere

392 Micro-Ion® Vacuum Transducer

- Combined Micro-Ion® ionization gauge technology with a miniature Pirani Conductron heat-loss sensor
- Dual ionization gauge filaments

SENSING SOLUTIONS



ETG.5003.1

TEMPERATURE CONVERTER Multichannel

- 3 – 5 channels
- $\pm 0.1^\circ\text{C}$ (2σ) stability
- 0.01°C resolution

VALVES



ETG.5003.2030

T2BA Exhaust Throttle Valve

- Advanced model-based pressure control algorithm
- High-speed configurations available (< 250 msec. open to close)
- Selectable high torque drives with soft-sealing available

ETHERCAT® PRODUCT SELECTION GUIDE

Product	Mailbox Service	Synchronization	Firmware
Automation & Control			
MicroNode™ Combo Programmable Automation Controller	<ul style="list-style-type: none"> • CoE • FoE 	<ul style="list-style-type: none"> • Free Run • DC Event • SM Event to 500 usec 	Yes
Flow			
G Series Mass Flow Controllers & Meters G Series Pressure Controllers	<ul style="list-style-type: none"> • CoE • FoE 	<ul style="list-style-type: none"> • Free Run • SM2 	Yes
P Series Pressure Controllers P Series Dual Zone Pressure Controllers Delta™ Flow Ratio Controllers	<ul style="list-style-type: none"> • CoE • FoE 	<ul style="list-style-type: none"> • Free Run • SM2 	Via FoE
HA-MFV Insitu Mass Flow Verifier	<ul style="list-style-type: none"> • CoE • FoE 	<ul style="list-style-type: none"> • Free Run • SM3 	Via FoE
Pressure/Vacuum Measurement			
901P Load Lock Transducer 902B Vacuum Transducer 925 MicroPirani Vacuum Transducer 972B DualMag™ Cold Cathode Transducer 390 Micro-Ion® Vacuum Transducer 392 Micro-Ion® Vacuum Transducer	<ul style="list-style-type: none"> • CoE • FoE 	SM Event	<ul style="list-style-type: none"> • EtherCAT • Transducer
DA03B Baratron® Capacitance Manometer DA05A Baratron® Capacitance Manometer DA06A Baratron® Capacitance Manometer DA07A Baratron® Capacitance Manometer	<ul style="list-style-type: none"> • CoE • FoE 	Free Run	Yes
Sensing Solution			
Temperature Converter	CoE	Free Run	EtherCAT
Valves			
T2BA Exhaust Throttle Valve	<ul style="list-style-type: none"> • CoE • FoE 	<ul style="list-style-type: none"> • Free Run (to loop update) • DC Event • SM Event 	<ul style="list-style-type: none"> • Via FoE • Via Web GUI



Product	Synchronization	Monitor Parameters
Plasma Sources		
Paragon® Remote Plasma Sources Revolution® Remote Plasma Sources CM12P1 Remote Plasma Source CH24P1 Remote Plasma Source	Free Run	<ul style="list-style-type: none">• Power• Run Time / Ignition Time• Faults• AC/DC Line• System Ready• Internal Device Temperature

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 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.

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