Flow & Pressure Measurement & Control

For Thin Film, Coatings & Surface Treatments

BROOKS® INSTRUMENT

Beyond Measure

Repeatable, accurate gas delivery. Superior integrity, proper thickness, and layer uniformity.

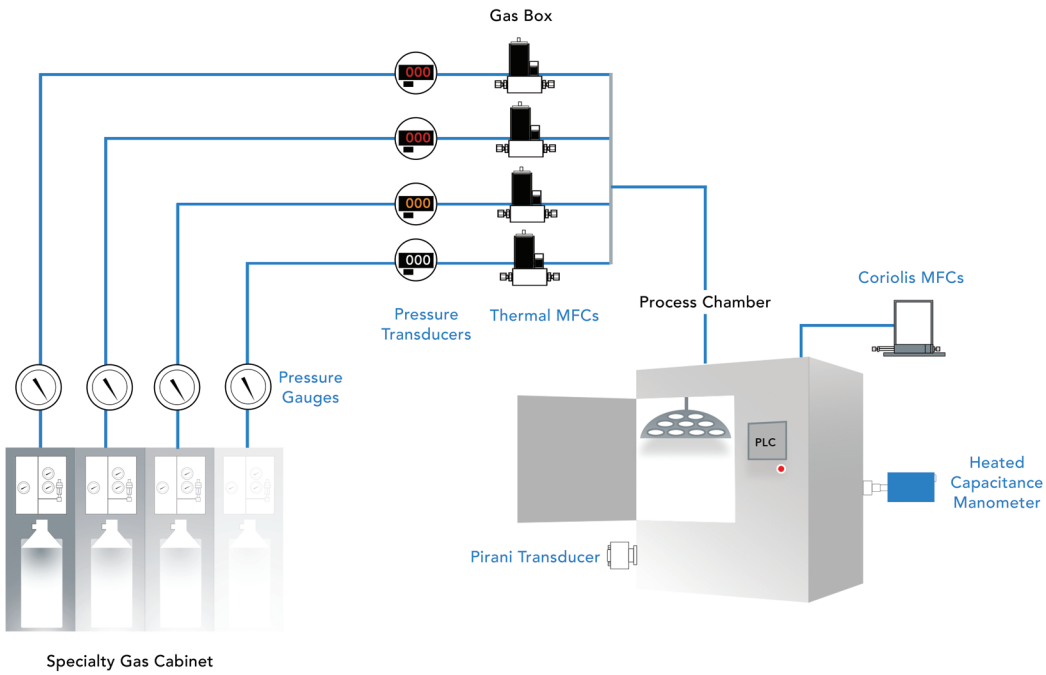
Thin film, coatings, and surface treatments cover a wide range of industries and applications. The surface of many products can be modified by applying a coating to improve the final characteristics of that product. It may be to improve the wear resistance of a cutting tool, scratch resistance of glass, thermal properties on sheet glass, or aesthetics on home fixtures. Whether by chemical vapor deposition (CVD), physical vapor deposition (PVD), plasma treatment processes, thermal spray coating or some other technique, this is often the final step in the manufacturing process. Brooks Instrument mass flow, pressure, and vacuum technologies ensure this critical step is done quickly, accurately, and consistently for maximum yield and throughput.

- Battery cells
- Coatings for packaging material
- Decorative & tool coatings
- DLC coatings
- Glass coatings
- Lab-grown diamonds
- Medical devices
- Optical coatings
- Solar cells

Thin Film Market Requirements	Brooks Instrument Provides
Multiple process instrument requirements	Gas flow, liquid flow and vacuum & pressure control solutions from one trusted partner
Consistent coating thickness and high uniformity	High accuracy, repeatability and reproducibility of reactive gases
High yield and throughput	Superior long-term stability
Easy integration into DCS/PLC/IoT systems	Full choice of communication protocols, web interface and enhanced device profiles for easy setup and integration as well as state of the art process control & automation
Simple and quick diagnosis and self-service capabilities	Embedded diagnostics and unique commands for enhanced process monitoring
Long-term protection against instrument contamination	Superior product design and material selection protects against the build-up of process deposition and particulates and minimizes the impact of corrosion

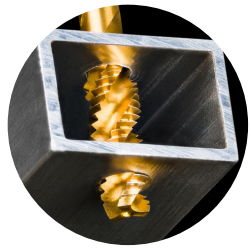
Precision Instrumentation for Today's Demanding Applications

Brooks Instrument mass flow and vacuum and pressure measurement and control devices support most of today's PVD and CVD process application setups. Our products are also well suited for other surface engineering applications, such as heat or plasma treatment processes.

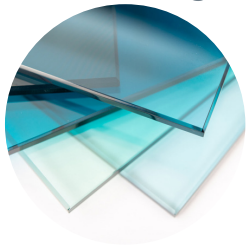


Applications

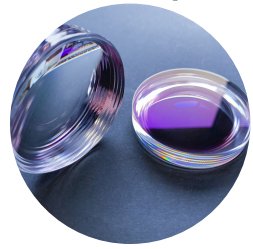
Decorative & Tool Coatings



Glass Coatings

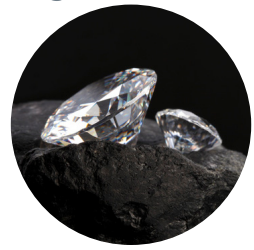


Precision Optics



Photovoltaics

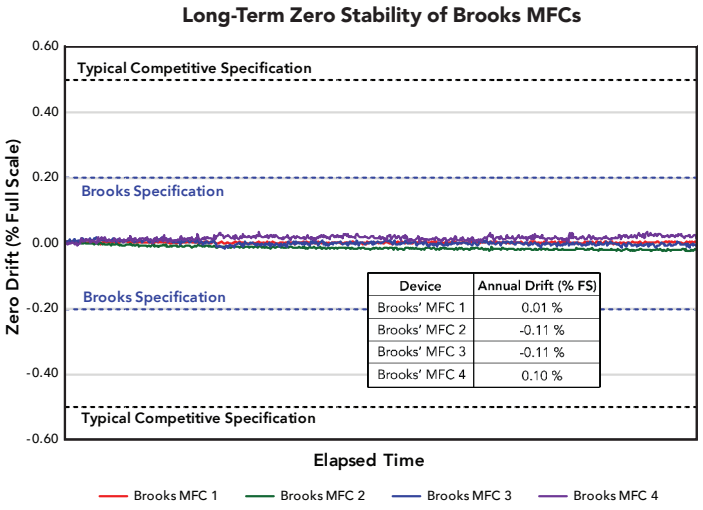
Lab-grown Diamonds



Battery Cells

Long-term consistent process control

Thin Film, coatings and surface treatment tools need accurate, stable gas control to maintain critical process parameters, combined with maximum uptime to reach target yields. Brooks Instrument mass flow controllers (MFCs) are engineered to deliver both, with superior long-term stability and the best mean-time-between-failures (MTBF) in the industry.



If the zero shifts, the entire process shifts, requiring maintenance and metrology intervention before starting the next lot

When a MFC has poor long-term stability, you spend more time verifying and recalibrating the device, costing money, time and lost opportunity to run your coating process. Our long-term zero stability means device recalibration or replacement is less frequent. This ensures consistent coating thickness and uniformity for each substrate, each coating campaign, and from one campaign to the next.

That stability is combined with excellent reliability: actual production and service data demonstrates that our SLA Series MFCs deliver decades of failure-free operation in a wide range of industrial process systems. The result: Thin Film coating and surface treatment tools using Brooks technology operate uninterrupted longer, to help maximize production uptime and reduce maintenance and machine downtime costs.

"I convinced one of the sites I support to purchase MFCs from Brooks to replace a competitor's devices by showing them how much less time I spent verifying Brooks' MFCs. In some cases, the competitor's devices were taking me four times longer to verify due to issues with drift."

Repair & Maintenance Engineer,
Multinational Glass Company

Mass Flow Controllers for Gas & Liquid

SLA5800 Series IP40-General Purpose MFCs

Proven MFC for widest range of mass flow needs and applications delivers superior results and lower total cost of ownership

GF40 Series Compact MFCs

Multiple gases and flows in one device maximize process flexibility and productivity while preserving accuracy, all in a compact footprint

GF100 Series High Purity MFCs

Ultra-fast response time and high-purity all-metal flow path minimizes contamination, enhances yield

Quantim® Coriolis MFCs

Most accurate measurement and control technology for very low flow rates of liquid or gas

Key Features

- Superior long-term drift stability and the best MTBF in the industry
- Industry-leading device linearity, repeatability and reproducibility
- Wide flow and pressure ranges
- Programmable gas and range capabilities
- Independent and easily accessible service port simplifies installation, diagnostics and troubleshooting
- Use with SLA Series pressure controllers to eliminate droop, boost and hysteresis
- Broad array of communication protocols available including EtherNet/IP™ and PROFINET®

- MultiFlo™ technology enables one MFC to support thousands of gas types and range combinations without removing it from the gas line or compromising on accuracy
- Excellent process gas accuracy
- Suitable for a full suite of gases

- Ultra-stable, highly accurate measurement sensors
- Fast precision control valves
- High-integrity (leak tight), ultra-high purity, all-metal wetted flow path
- Corrosion-resistant Hastelloy® sensor
- MultiFlo™ programmable gas and range capabilities

- True mass flow measurement, not inferred
- Multi-variable outputs of mass flow, volume flow, density and temperature
- High pressure capability for demanding research applications
- Optional hazardous area approvals for Zone 2 and Class 1 Division 2
- Third generation platform with latest digital architecture enables faster data speeds, improved zero stability and enhanced alarms & diagnostics to support Industry 4.0 trends
- Easily accessible service port simplifies installation, alarms setup, diagnostics and troubleshooting
- Communication protocols: RS485, HART and Analog

Performance

- Flow Range: 3 sccm – 2500 slpm
- Accuracy: ±0.6% of SP (20-100% FS)
- Repeatability: < ±0.2% SP
- Response Time: <1 sec – <3 secs
- Temperature Range: -14 – 65°C

- Flow Range: 3 sccm – 50 slpm
- Accuracy: ±1% of SP (35-100% FS)
- Repeatability: < ±0.2% SP
- Response Time: <1 sec – <3 secs
- Temperature Range: 5 – 50°C

- Flow Range: 3 sccm – 300 slpm
- Accuracy: ±1% of SP
- Repeatability: < ±0.15% SP
- Response Time: 300 ms – <1 sec
- Temperature Range: 5 – 50°C

- Flow Range: 1 – 27,000 ml/hr
- Accuracy: 0.2% – 0.5% of rate
- Repeatability: <±0.05% SP
- Response Time: <0.5 sec – <2 secs
- Temperature Range: 0 – 65°C

Vacuum & Pressure Measurement and Control

XacTorr Series Capacitance Manometers

Advanced vacuum measurement technology virtually eliminates drift and provides longer operational life

VersaTorr Series Vacuum Gauges

All-in-one ultra-wide range measurement solutions for many vacuum applications

SolidSense II® Pressure Transducers

Smart, precise digital measurement through dependable pressure monitoring in ultra-high purity and specialty gas applications

SLA Series Pressure Controllers

Achieve better accuracy, stability and reliability with electronic pressure controllers

Key Features

- Shielded sensor resists particle accumulation
- Dual-zone temperature control improves measurement stability and repeatability
- Multi-decade digital calibration provides superior window of known accuracy
- Independent diagnostic service port
- Heated or unheated models available

- Ultra-wide measuring range of 9 decades
- Programmable settings and parameters
- Heat-loss MEMS Pirani to measure most accurately in the low and medium vacuum ranges
- Tri-Sensor Transducer model uses precision capacitance diaphragm gauge sensor to eliminate gas dependencies

- Weld-free, corrosion-resistant materials
- Proprietary micro-machined silicon strain gauges for ultra-stable measurement
- Models available with integrated display or optional separate top-mounted display

- Eliminate droop, boost and hysteresis through closed loop control utilizing the core technology in our thermal MFCs
- Use with SLA Series mass flow devices to maximize process consistency benefits
- Downstream or upstream control modes
- Durable, robust metal top lid prevents damage during installation

Performance

- Pressure Ranges: 0.1 to 1000 Torr
- Accuracy: ±0.15% to 0.25% of reading
- Temperature Range: Ambient to 160°C
- Measurement Range: 4 Decades

- Pressure Ranges: 7.5×10^{-7} to 1000 Torr
- Accuracy: ±5% to ±0.5% of reading
- Temperature Range: Ambient to 50°C
- Measurement Range: 9 Decades

- Pressure Range: 15 to 3000 psi (205 bar)
- Accuracy: 0.25% FS (BFSL)
- Proof Pressure: 200% FS up to 2,000 psi

- Pressure Control Range: 20:1 up to 1500 psi (100 bar)
- Accuracies: ±0.25% of Transducer FS (FS >300 psia), ±0.12% of Transducer FS (FS <300 psia)
- Flow Range: 3 sccm – 50 slpm

Advanced in-situ flow diagnostics & trending maximizes process yield

Available on EtherNet/IP and PROFINET Enabled SLA Series MFCs

Warnings & Alarms

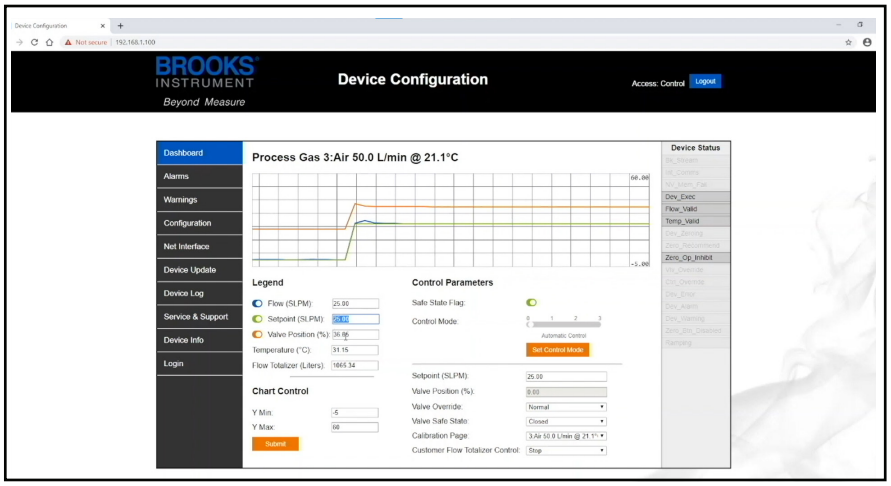
- Informational notifications to the user from the MFC
- Customize how alarms are triggered and implemented

Diagnostics

- Used to identify customer system failures
- Can be used as predictive indication system and to monitor reliability
- Can indicate when MFC maintenance is required

- Restricted Flow Alarm (low inlet pressure)
- Excessive Zero Drift/ Failure
- High Flow
- Internal Power Supply Failure
- Low Flow
- No Flow Indication

Web-based Interface for easy commissioning, configuration & troubleshooting



- Easily configure device settings
- Reading multiple variables simultaneously
- Set up thresholds and alarms
- Adjust tuning parameters
- Monitor devices

BEST Software for Setup, Troubleshooting & Calibration

Our Brooks Expert Support Tool (BEST) down`loadable software along with a cable kit is a Windows® based application that performs all of the functions of the web-based interface plus in-situ verification and recalibration of Brooks Instrument devices. It allows the user to take advantage of servicing tasks that include setup, attribute configuration, diagnostics, troubleshooting, valve tuning, verification and calibration.

BROOKS® INSTRUMENT

Beyond Measure

Service and Support

Global Service and Support

Brooks Instrument products are recognized as the most stable and reliable in the world. To keep your products operating at the highest level of accuracy and extend their life, your best choice is to trust Brooks Instrument Factory Certified Service repair and recalibration offerings.

Only Brooks Instrument Factory Certified Service ensures that your Brooks Instrument flow, pressure, vapor and vacuum products are serviced utilizing the same metrology standards, work instructions, equipment and custom software as our manufacturing processes — by expert technicians trained exclusively on servicing Brooks products.

Our global service center network offers fast turnaround on repair and recalibration requests.

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