PRODUCT GUIDE

BROOKS® INSTRUMENT

Application Experience
Beyond Measure

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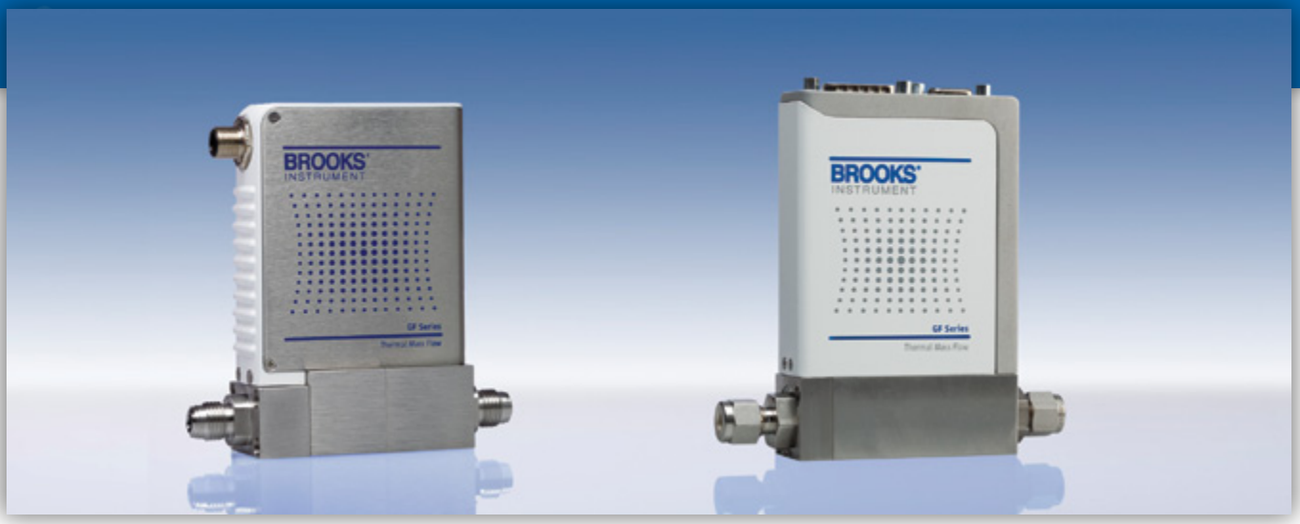
MultiFlo™ Capable Mass Flow Controllers and Meters



GF100 Series GF40/80 Series

GF100 Series mass flow measurement and control

Designed for semiconductor, MOCVD and other gas flow control applications that require a high-purity, all-metal flow path, the Brooks GF Series mass flow controllers deliver outstanding performance, reliability and flexibility. The GF Series has been marathon-tested to over three times the semiconductor industry standard for reliability, ensuring repeatable low-drift performance over time.

- Ultra-fast 300-millisecond settling time
- Optional pressure transient insensitive (PTI), high accuracy and safe delivery system models available
- MultiFlo™ gas and range configurability
- Corrosion-resistant Hastelloy® sensor tube and valve orifice (jet)

GF40/80 mass flow measurement and control

Designed for solar thin film deposition, CVD, vacuum processes, bioreactors and other industrial gas flow control applications that require cost-efficient solutions.

- Elastomer or metal seal
- Fast sub 1 second settling time
- MultiFlo gas and range configurability
- Corrosion-resistant Hastelloy sensor tube

Type	Model	Full-Scale Capacity	Accuracy	Max. Pressure psig (bar)	Input/Output	Power Supply
UHP PTI Metal Seal Controller	GF125	3 sccm – 55 slpm N_2 equivalent	+/-1% rate (35 – 100% FS)	85 (6)	0 – 5 Vdc/RS485/ DeviceNet	+/-15 Vdc, 11 – 25 Vdc
UHP Metal Seal Controller/Meter	GF120	3 sccm – 55 slpm N_2 equivalent	+/-1% rate (35 – 100% FS)	485 (33)	0 – 5 Vdc/RS485/ DeviceNet	+/-15 Vdc, 11 – 25 Vdc
HP Metal Seal Controller/Meter	GF100	3 sccm – 55 slpm N_2 equivalent	+/-1% rate (35 – 100% FS)	485 (33)	0 – 5 Vdc/RS485/ DeviceNet	+/-15 Vdc, 11 – 25 Vdc
UHP High-Accuracy Metal Seal Controller/Meter	GF125 (HA)	5 sccm – 10 slpm N_2 equivalent	+/-1% rate (10 – 100% FS)	85 (6)	0 – 5 Vdc/RS485/ DeviceNet	+/-15 Vdc, 11 – 25 Vdc
UHP Safe Delivery Metal Seal Controller	GF120 (SDS) Safe Delivery System	4 sccm – 1 slpm	+/-1% rate (35 – 100% FS)	485 (33)	0 – 5 Vdc/RS485/ DeviceNet	+/-15 Vdc, 11 – 25 Vdc
Metal Seal Controller/Meter	GF80	3 sccm – 50 slpm	+/-1% rate (35 – 100% FS)	150 (10)	0 – 5 Vdc/4 – 20mA/ Profibus/ RS485/ DeviceNet/ EtherCAT	15 – 24 Vdc, 12 – 24 Vdc, 11 – 25 Vdc
Elastomer Seal Controller/Meter	GF40	3 sccm – 50 slpm	+/-1% rate (35 – 100% FS)	150 (10)	0 – 5 Vdc/4 – 20mA/ Profibus/ RS485/ DeviceNet/ EtherCAT	15 – 24 Vdc, 12 – 24 Vdc, 11 – 25 Vdc

DeviceNet PROFIBUS EtherCAT

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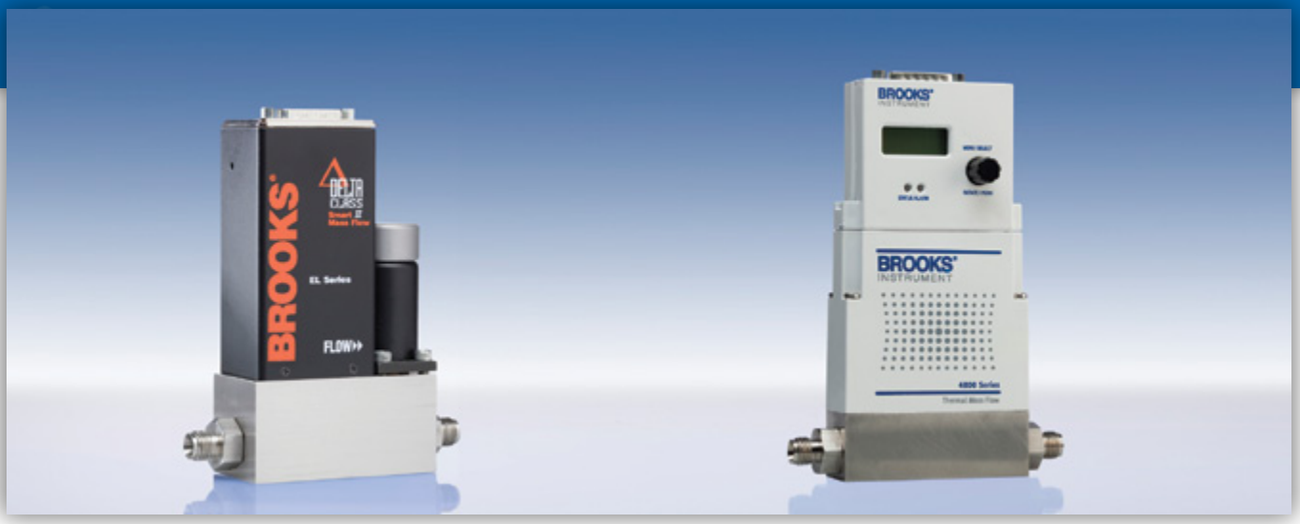
General Purpose Mass Flow Controllers and Meters



SLA5800 Series | 4800 Series

With the largest installed base of thermal mass flow controllers and meters around the world, Brooks offers products with faster response, better accuracy and improved control over analog devices.

- Industry-leading repeatability ensures a stable process even under changing conditions
- Self diagnostics and alarms eliminate downtime
- Multiple communication protocols allow easy integration into many control systems
- Analog I/O devices allow for quick and easy system integration
- Elastomer seal option provides exceptional leak integrity and maximizes control valve shutoff dependability
- Globally approved for a variety of service areas

The Smart Link Advantage (SLA) Series is Brooks' premier smart digital thermal mass flow series. SLA mass flow controllers and mass flow meters link to advanced service tools and offer the advantage of digital protocols. The SLA Series provides many advanced features such as enhanced temperature stability, zero-drift diagnostics, coplanar valve for improved turndown, and more.

The 4800 Series features a broad flow range, compact size and MEMS-based sensor that provides lightning-fast response times.

Type	Model	Full-Scale Capacity	Accuracy	Max. Pressure psig (bar)	Input/Output	Power Supply
Elastomer Seal Controller/Meter	SLA5800 Series	3 sccm – 2500 slpm	1% rate or 0.7% rate ±0.2% FS	4500 (300)	0 – 5 Vdc, 4 – 20 mA RS485, DeviceNet, FOUNDATION™ Fieldbus	13.5 – 27 Vdc, 11 – 25 Vdc, 14 – 27 Vdc
Elastomer Seal Controller/Meter	5800S Series	3 sccm – 2500 slpm	0.7% rate & ±0.2% FS	4500 (300)	Profibus	15 – 24 Vdc
Elastomer Seal Controller/Meter	4800 Series	50 sccm – 40 slpm	+/-1% FS or +/-3% FS	150 (10)	0 – 5 Vdc, 4 – 20 mA RS232/RS485, Profibus	15 – 24 Vdc
Elastomer Seal Controller/Meter	5800E Series	3 sccm – 1000 slpm	1% FS	1500 (100)	0 – 5 Vdc	+/-15 Vdc
Elastomer Seal Controller/Meter	5800i Series	3 sccm – 1000 slpm	1% FS	1500 (100)	0 – 5 Vdc or 4 – 20 mA	15 – 24 Vdc
Metal Seal Controller/Meter	5800EM Series	3 sccm – 100 slpm (200 slpm H_2)	1% FS	1500 (100)	0 – 5 Vdc or 4 – 20 mA	+/-15 Vdc or 15 – 24 Vdc

DeviceNet FOUNDATION PROFIBUS

Low-Flow Glass Tube Variable Area Meters

1350 Sho-Rate™ | 1358 Sho-Rate™ | 1250 Sho-Rate™

The name Sho-Rate™ has meant reliability and performance for decades now, and the 1350 and 1355 Sho-Rate variable area meters continue to deliver industry-leading performance for gas or liquid flows today. Their robust and proven engineering ensures reliable indication and unsurpassed service life. Sho-Rate flow meters pioneered the concept of field-replaceable tube and float kits; the tube and float can be replaced in-line, if necessary, in a matter of minutes. Now Brooks introduces the new 1250 and 1255 Sho-Rate. These glass tube flow meters offer an easy-to-read rotating magnifying glass, making it the ideal choice for display on panels and cabinets.

1350/1355 Sho-Rate
Rugged and durable

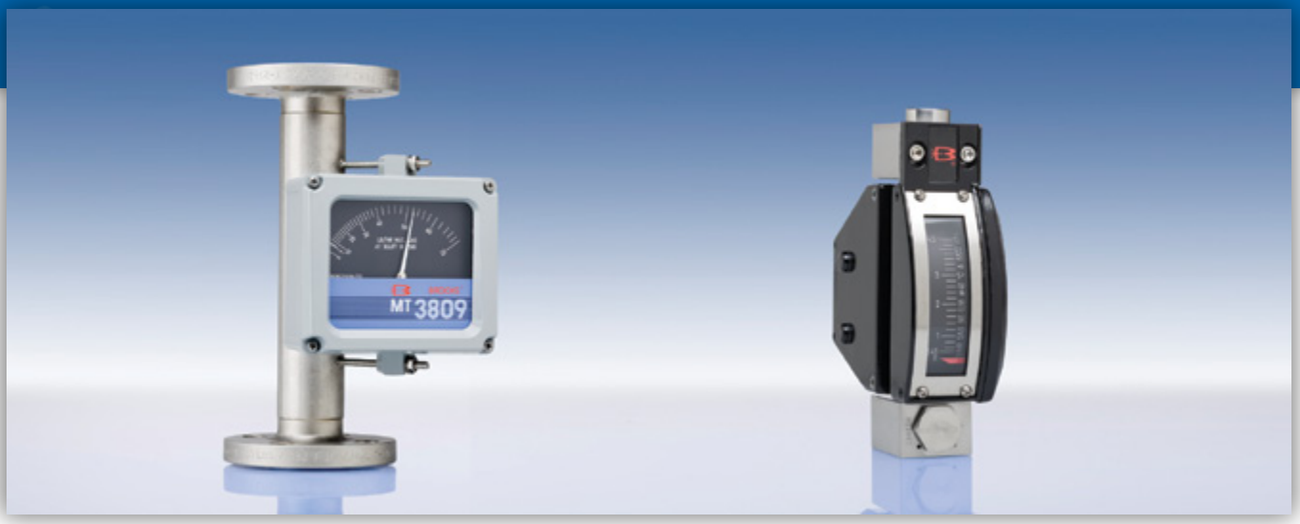
- Integral needle valves on inlet or outlet
- Integral flow controller that compensates for varying inlet or outlet pressures
- 316 stainless, brass, aluminum or Kynar™ construction
- Custom scales for any application

1250/1255 Sho-Rate
Ideal for panel display

- Integral needle valves on inlet or outlet
- Direct-read scales for common units and fluids
- Easy-change design allows quick interchangeability of tube assemblies
- Rotating lens allows 180° view with magnification

Model	Capacity – Water (lph)	Capacity – Water (gph)	Capacity – Air (m_3n/hr)	Capacity – Air (scfm)	Accuracy	Max. Pressure psig (bar)	Construction
1350/1355 Sho-Rate	0.035 – 120	0.009 – 32	0.003 – 3.9	0.001 – 2.2	10% (1350) FS 5% (1355) FS	200 (14)	Glass tube w/ brass, 316 SS or Kynar
1358 Sho-Rate	180 – 1000	49 – 280	5.7 – 22	3.4 – 15	10% FS	200 (14)	Glass tube w/ brass or 316 SS
1250/1255 Sho-Rate	1.3 – 120	0.34 – 32	0.003 – 3.9	0.001 – 2.33	10% (1250) FS 5% (1255) FS	200 (14)	Glass tube w/ aluminum or 316 SS

Armored Metal Tube Variable Area Meters



MT3809 | 3750 Ar-Mite™

The Brooks line of rugged metal tube variable area meters (rotameters) is ideal for high-pressure, high-temperature and other demanding flow applications where safety is a concern.

- Globally approved for use in hazardous environments
- Needle valves available for flow control
- Multiple connection options to match your existing system and provide easy installation
- Many corrosion-resistant material options for the metering of aggressive fluids
- Alarm and 4 – 20 mA with HART and FOUNDATION™ Fieldbus options provide for remote flow monitoring
- Excellent meter repeatability provides consistent batch and/or process production
- No power required, which reduces installation cost and provides flow measurement in hazardous areas
- Low-pressure drop

Model	Capacity – Water (lph)	Capacity – Water (gpm)	Capacity – Air (m_3n/hr)	Capacity – Air (scfm)	Accuracy	Max. Pressure psig (bar)	Output
MT3809	25 – 100,000[1]	0.11 – 440[1]	0.8 – 1200[1]	0.49 – 750[1]	2% FS	1500 (100)[2]	Alarm and/or 4 – 20 mA, HART, FOUNDATION Fieldbus (IS or X-Proof)
MT3819	110 – 15,000	0.48 – 66	3.7 – 470	2 – 280	2% FS	275 (19)	Alarm and/or 4 – 20 mA, HART, FOUNDATION Fieldbus (IS or X-Proof)
MT3810	25 – 20,000	0.11 – 88	0.8 – 650	0.49 – 390	5% FS	1500 (100)	Alarm and/or 4 – 20 mA, HART (IS or X-Proof)
MT3750	0.8 – 100	0.003 – 0.44	0.04 – 3.1	0.02 – 1.9	5% FS	4000 (275)	Alarm and/or 4 – 20 mA, HART, FOUNDATION Fieldbus (IS or X-Proof)
3600 Series	19 – 11,000	0.08 – 49	0.65 – 43	0.38 – 28	10% FS	1500 (100)	Alarm (IS or X-Proof)

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HART FIELD COMMUNICATIONS PROTOCOL

[1] Special designs for flow rates as low as 5 l/h of air and 0.08 l/h of water are available. Consult your local representative for more information.

[2] Special designs for up to 15,000 psi (1000 bar) are available. Consult your local representative for more information.

High-Flow Glass Tube Variable Area Meters

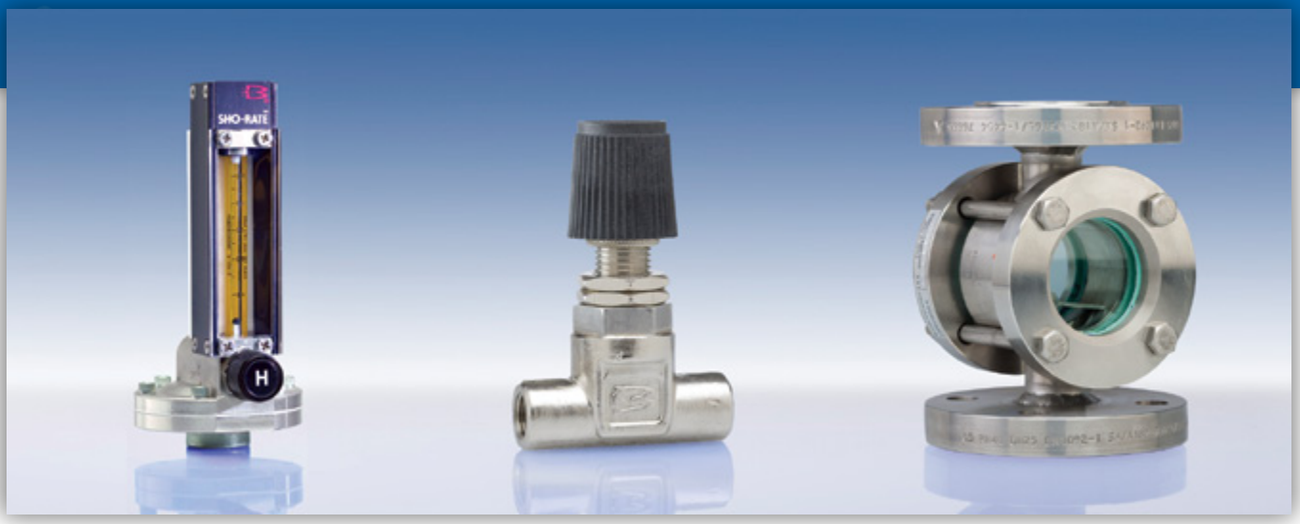
GT1000 GT1100 GT1305

The Brooks line of reliable glass tube variable area meters (rotameters) is ideal for many gas and liquid flow measuring applications where viewing the process is important.

- Tube and float can be re-ranged in-line, minimizing process downtime
- Rotatable connections for easy installation at any angle
- Packing gland or O-ring sealing to meet piping requirements or customer preference
- Globally approved for use in hazardous environments
- Reliable – only one moving part
- No power required, which reduces installation cost and provides flow measurement in hazardous areas
- Low-pressure drop allows for economical pump selection
- Flow alarms available on some models
- Rugged, vented polycarbonate enclosure available on most models

Model	Capacity – Water (lph)	Capacity – Water (gpm)	Capacity – Air (m_3n/hr)	Capacity – Air (scfm)	Accuracy	Max. Pressure psig (bar)	Output
GT1000	0.032 – 22,000	0.0001 – 98	0.002 – 280	0.001 – 170	2% FS	500 (34)	Alarm (IS)
GT1100	0.032 – 22,000	0.0001 – 98	0.002 – 280	0.001 – 170	2% FS	500 (34)	Local indication
GT1307	35 – 22,000	0.15 – 98	1.5 – 280	0.9 – 170	2% FS	350 (24)	Local indication
GT1306	24 – 2200	0.1 – 9.8	1.2 – 63	0.8 – 39	3% FS	350 (24)	Local indication
GT1305	180 – 11,000	0.8 – 50	5.4 – 90	3 – 55	10% FS	200 (14)	Alarm (IS)

Precision Valves, Controllers, Switches and Indicators



FC8800 Series
with 1350 Sho-Rate™

8500 Series NRS™

1198

Manual Flow Controller

Brooks Model FC8800/8900 Series flow controllers are designed to maintain a constant differential pressure across an integral manual flow regulating valve.

- Series 8800 controllers are designed for all liquid and gas flows with variable upstream pressures.
- Series 8900 controllers are for all liquid and gas flows with variable downstream pressures.

Control Valve, Fine Control

Brooks Model 8500 Series NRS™ (non-rising stem) control valves are designed specifically for extremely low-flow gas and liquid applications. Straight and 90° angle models in brass or stainless steel are available. They feature a means of adjusting a sliding tapered needle, which prevents sticking. These valves are particularly suitable for precise control and possess a high turns-to-lift ratio. The flow is constant for any given stem position.

Flow Switch

The CCB311 flow switch is designed to detect low flows in horizontal or vertical pipes with an upward flow direction. Suitable for liquids or gases, the CCB311 flow switch is very robust with high repeatability and a very basic design. It is certified explosion proof/intrinsically safe.

Flow Indicator

Brooks Instrument Model 1198 flow indicators provide a quick, reliable and economical way to verify fluid flows through industrial process lines. Model 1198 is available with three styles of indicators including paddle wheel, flap style or drip tube/whistle shape. Many specials are also available upon request to meet various conditions of pressure, temperature, fluid types and mechanical dimensions.

Pressure/Vacuum Controllers

SLA7810/20 Series | SLA5810/20 Elastomer Series | Model 5866M Series

Electronic pressure controllers are flexible devices to manage the pressure of gas upstream or downstream of the device. Brooks electronic pressure controllers utilize the core control technology present in our industry-leading thermal mass flow controllers.

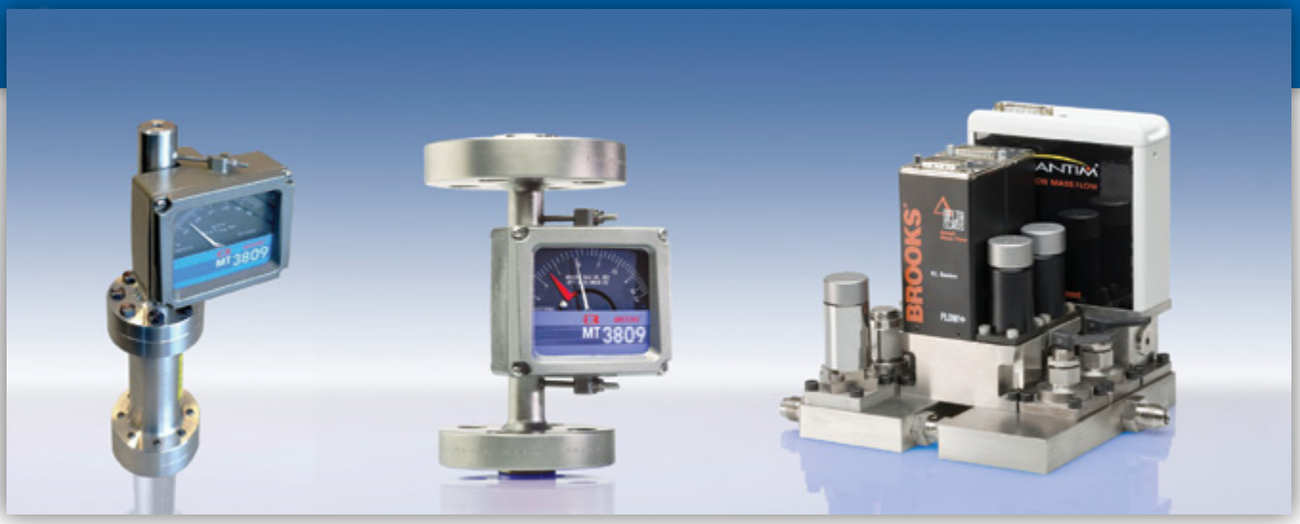
Brooks replaces the thermal mass flow sensor with a pressure sensor, provides industry-leading control valve technology and software, then controls the pressure of a fluid based on a set-point signal to the device. Using a closed-loop control, Brooks pressure controllers do not have the droop or hysterisis associated with traditional mechanical spring diaphragm pressure regulators. Brooks pressure controllers are available with internal pressure sensors to control pressure in a range from vacuum to 4500 psig.

Brooks pressure controllers can be configured to use external pressure sensors for added flexibility. When using an external pressure sensor, the flow of the gas required to maintain pressure can be controlled and measured.

Type	Model	Full-Scale Capacity	Pressure Accuracy	Max. Pressure psig (bar)	Input/Output	Power Supply
Pressure Controllers						
Metal Seal, 1.125"	SLA7810/20	0 – 20 bar (0 – 290 psia)	0.5% FS	290 (20)	0 – 5 Vdc, DeviceNet	15 Vdc, 11 – 25 Vdc
Elastomer Seal	SLA5810/20	0 – 300 bar (0 – 4350 psia)	0.5% FS	4500 (300)	0 – 5 Vdc, 4 – 20 mA DeviceNet, FOUNDATION Fieldbus	15 – 24 Vdc, 11 – 25 Vdc, 14 – 27 Vdc
Elastomer Seal	5866E	0 – 300 bar (0 – 4350 psia)	0.5% FS	4500 (300)	0 – 5 Vdc, 4 – 20 mA	+/- 15 Vdc

Type	Model	Full-Scale Capacity	Flow Accuracy	Max. Pressure psig (bar)	Input/Output	Power Supply
Remote Transducers/Pressure Controlling Flow Meters						
Metal Seal, 1.125"	SLA7840	3 sccm – 30 slpm	1% Rate	1500 (100)	0 – 5 Vdc, DeviceNet	15 Vdc, 11 – 25 Vdc
Elastomer Seal	SLA5840	3 sccm – 30 slpm	1% Rate	1500 (100)	0 – 5 Vdc, DeviceNet	15 Vdc, 11 – 25 Vdc
Elastomer Seal	5866RT	3 sccm – 30 slpm	1% FS	1500 (100)	0 – 5 Vdc	+/- 15 Vdc

Customized Systems and Solutions



MT3809 Special | MT3809 Special | Manifold Solution

Custom engineering for special applications

Can't find the exact instrument for your application? Let Brooks' application experts devise a custom solution for you. Our expertise in custom-engineered flow products for unique applications includes:

- Special ambient requirements
- High/low process temperature operation
- Exotic materials
- High process pressure capability
- Difficult process streams

If you have a unique application, contact Brooks or your local sales representative.

Comprehensive Solutions

Customers tight on resources and time often seek engineering partners to design the complete system for a new process or to keep their existing process up-to-date and running smoothly. Brooks' solutions-based approach to solving customer applications is ideal.

Brooks' Solutions Group can provide various plans including expert application advice and engineering, ready-to-assemble "kits" and complete, integrated, turnkey systems. We have also developed unique direct liquid injection vaporization systems, manifold systems, precise measurement solutions for dosing applications, and more.

Solutions for OEMs

Many Brooks Instrument products are ideal for OEM customers, providing high-performing, cost-effective solutions. Current Brooks OEM customers include medical device equipment manufacturers, analyzer manufacturers, suppliers of gas blending equipment, vacuum pump makers, and industrial processing equipment suppliers. Brooks can customize any standard product to meet OEM requirements.

- Compact thermal mass flow meters and controllers
- Needle valves for precise flow control
- Compact pressure regulators
- Flow controllers for variable upstream or downstream pressures
- Custom variable area glass tube assemblies available for your unique flow application
- Customized variable area, thermal mass and Coriolis flow controllers and pressure products
- Private labeling available

Coriolis Mass Flow Controllers and Meters

QMBC IP40 QMBC IP66

Brooks Quantim Coriolis mass flow controllers and meters offer unsurpassed accuracy and flexibility in critical low-flow liquid and gas applications.

The heart of the device is a patented Coriolis sensor design that measures low flows independent of the fluid type or process variables. This provides you with unsurpassed performance, repeatable mass flow measurement and control even under changing conditions.

Brooks Quantim products are some of the smallest, lowest-flow Coriolis meters and controllers available on the market. With a footprint the size of a netbook, you can fit this instrument into any tight space.

Coriolis meters and controllers are available in NEMA 1/IP40, NEMA 4X/IP66, explosion proof and ANSI/ISA-76 downport configurations.

Type	Model	Tube Size	Nominal Flow* liquid (kg/hr)/gas (lpm)	Accuracy	Max. Pressure psig (bar)	Input/Output
Precision Mass Flow Controller Gas and Liquid	QMBC	2	0.15/1.05	+/-0.2%, 0.5% or 1% rate	500 (35), 1500 (100) or 4500 (300)	0 – 5 Vdc, 4 – 20 mA or HART
		3	0.78/2.96			
		4	7.97/24.8			
Precision Mass Flow Meter Gas and Liquid	QMBM	2	0.19/1.43	+/-0.2%, 0.5% or 1% rate	500 (35), 1500 (100) or 4500 (300)	0 – 5 Vdc, 4 – 20 mA or HART
		3	1.00/5.60			
		4	13.5/53.1			

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* Higher flows may be possible depending on the fluid and process conditions.

Secondary Electronics and Software Tools

Model 0254 | Model 0260 | Brooks Service Suite

Model 0254 four-channel power supply, readout and set-point controller

The Brooks 0254 is an innovative, reliable microcomputer-based controller that provides power for up to four Brooks mass flow meters and controllers, and/or pressure devices, all in a new compact design. Additionally, the 0254 can generate flow set-point commands, display flow rate, totalize flow, batch, blend multiple flow streams and more. This fully RoHS-compliant device has a very user-friendly operation and is offered with multiple mounting options such as rack mount, panel mount and table-top mount.

Brooks Smart Interface Model 0260 controls and monitors up to 30 devices

The Brooks Smart Interface Model 0260 is a Microsoft Windows®-based software application that provides expanded control and monitoring capabilities in laboratory and research environments for Brooks thermal mass flow meters and controllers with an RS485 Smart protocol digital interface. Together with the power supply and RS485 to USB hardware module, this product is a great solution for monitoring and controlling up to 30 mass flow meters/controllers.

Model	Channels	Additional Functions	Control I/O	Power Input	Power Output
0254	4	Totalize and blend RS-232 I/O for remote control	1 – 5 Vdc, 2 – 10 Vdc, 4 – 20 mA	100 – 240 Vac, 50/60 Hz	+/-15 Vdc, 24 Vdc
0260	Up to 30 devices	Display flow, adjust set point, display alarm status, display and change valve override (VOR) status, totalize, batch, blend, log data	RS485 Smart Protocol	85 – 250 Vac, 47 – 63 Hz	24 Vdc, 3.5 A

Brooks Service Suite

Brooks Instrument provides a variety of software and accessory options to simplify installations and start-up. Brooks software tools ensure mass flow controllers perform at their best. Calibration and control software, available for some models, allow customers to perform calibration checks to verify accuracy and repeatability.

Brooks Service Suite, Standard: Provides access to I/O tuning, alarm indication/configuration, diagnostics, selected response tuning, control and monitor.

Brooks Service Suite, Pro: Provides access to I/O tuning, alarm indication/configuration, diagnostics, selected response tuning, control and monitor, plus calibration and accuracy reporting capabilities.