Model SLA5850
with EtherNet/IP™

DATA SHEET

Mass Flow Controllers & Meters

SLA5800 Series

Elastomer Sealed, Digital, General Purpose Thermal Mass Flow Meters & Controllers for Gases

The SLA5800 Series thermal mass flow meters and mass flow controllers have gained broad acceptance as the standard for accuracy, stability and reliability. These products have a wide flow measurement range and are suitable for a broad range of temperature and pressure conditions making them well suited for chemical and petrochemical research, laboratory, analytical, fuel cell and life science applications, among others.

Highlights of the SLA5800 Series include: industry leading long-term stability, accuracy backed by superior 17025 metrology systems and methods using calibration systems directly traceable to international standards, and a broad range of analog and digital I/O options to suit virtually any application. An independent diagnostic/service port permits users to set alarms and diagnostics, tune, troubleshoot or change flow conditions without removing the mass flow controller from service.

The SLA5800 Series provides a highly configurable platform based on a simple modular architecture. The feature set was carefully selected to enable drop-in replacement and upgrade of many brands of mass flow controllers. With the wide range of features and options available, the SLA5800 Series provides users with a single platform to support a broad range of applications.

Features	Benefits
Industry leading long-term sensor stability	Increased system uptime and reduced cost of ownership by reducing maintenance and eliminating periodic recipe adjustments and/or recalibrations
User accessible service port	Simplified installation, start-up, troubleshooting and access to diagnostics provides maximum uptime
Alarms and diagnostics	Ensures device is operating within user specified limits for high process yield and uptime
Superior valve technology	Minimum leak-by, wide turndown, fast response and superior corrosion resistant materials reduces overall gas panel cost and increases throughput
High accuracy traceable to international standards	Calibration by verified metrology systems ensures precise process gas flow control
Simple modular design	Easy-to-service elastomer sealed design provides for factory or field service maximizing uptime and reducing total cost of ownership
Adaptable mechanical configurations	Easily retrofit to existing systems

View SLA5800 Product Page

Superior Thermal Flow Measurement Sensor

Brooks' sensor technology combines:

- Excellent signal to noise performance for good accuracy at low setpoints
- Superior long-term stability through enhanced sensor design manufacturing and extensive burn-in process
- Isothermal packaging to reduce sensitivity to external temperature changes

Advanced Diagnostics

The mass flow controller remains the most complex and critical component in gas delivery systems. When dealing with highly toxic or corrosive gases, removing the mass flow controller to determine if it is faulty should be the last resort. In response to this, Brooks pioneered smarter mass flow controllers with embedded self-test routines and introduced an independent diagnostic/ service port to provide the user with a simple interface, for troubleshooting without disturbing flow controller operation.

Wide Flow Range

The SLA5800 Series covers an extremely broad range of flow rates. Model SLA5850 can have a full scale flow as low as 3 ccm. With a high turndown ratio of 100:1 for any full scale range from 1-50 lpm N2 equivalent and 50:1 (250:1 turndown for *Biotech* Options Packages up to 150 LPM) turndown for all other flow rates, accurate gas flow can be measured or controlled down to 0.06 ccm! Model SLA5853 can monitor or control gas flows up to 2500 lpm.

Fast Response Performance

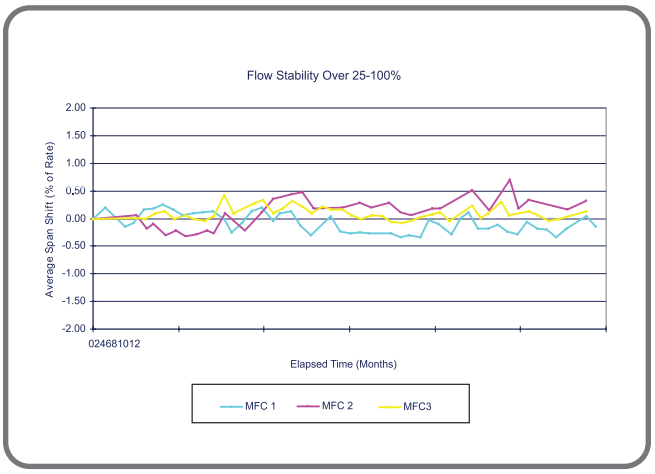
The all-digital electronics and superior mechanical configuration in the SLA5800 Series provide for ultra-fast response characteristics.

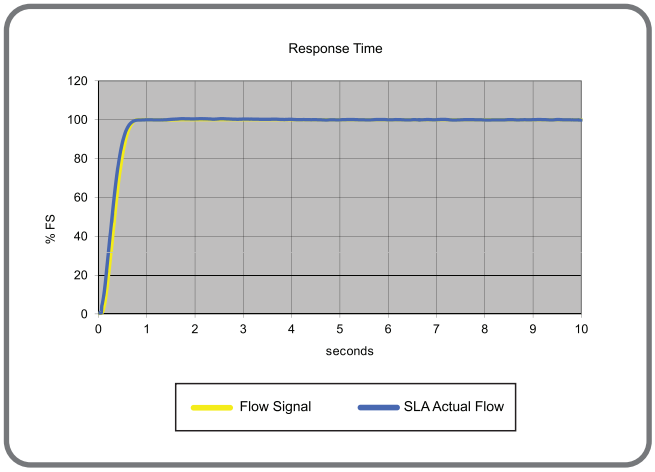
Broad Array of Communication Options

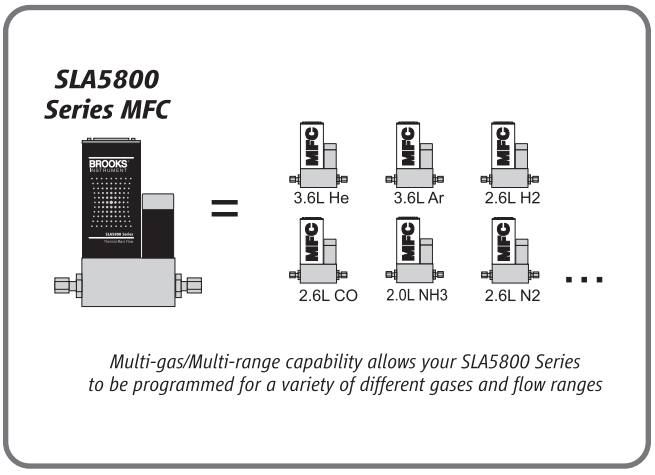
Traditional 0-5 Vdc and 4-20mA analog options as well as RS485 digital communications are available ("S-protocol", based on HART). Control interfaces via digital network protocols including EtherNet/IP™, PROFINET, DeviceNet®, and Profibus® are also available . EtherNet/IP™ and PROFINET are a modern, high-speed digital protocol that permits multiple , additional diagnostics to provide MFC users with rich, real-time system information. DeviceNet® has been certified by the ODVA (Open DeviceNet Vendor's Association). EtherNET/IP™ and PROFINET are pending industry conformance certification.

Multi-gas/Multi-range Capabilities

The SLA5800 Series multi-gas and multi-range capabilities reduce inventory. Storage and pre-programming of up to 6 gas calibrations easily permits users to switch between different gasses and ranges on a single device.







Multi-gas/Multi-range capability allows your SLA5800 Series to be programmed for a variety of different gases and flow ranges

SLA5800 Series Standard

Flow Ranges and Pressure Ratings:

Mass Flow Controller Model	Mass Flow Meter Model	Flow Ranges N2 Eq. Ratings		Maximum Operating Pressure		PED Module H Category
		Min. F.S.	Max. F.S.	Standard [1]	Optional [1]	
SLA5850	SLA5860	0.003	50 lpm	1500 psi/103 bar	4500 psi/310 bar @ Maximum Flow of 10 lpm N2	SEP
SLA5851	SLA5861	15	150 lpm[2]	1500 psi/103 bar	NA[3]	SEP
SLA5853	SLA5863	100	2500 lpm	1000 psi/70 bar	NA	Category 1 for all 150 lb flanges Category 2 for all other connections

[1] Sanitary fittings - Model code 5A, 5B, 5C, 5D & 5E rated to 500 psi Maximum Pressure

[2] 600 lpm of H2 possible with decreased accuracy in mechanical connection section > 40 psig inlet required for flows greater than 100 lpm N_2 equivalent.

[3] 4500 psi/310 bar available as a special on SLA5861 only

	SLA5850/60	SLA5851/61	SLA5853/63
PERFORMANCE			
Flow Accuracy (accuracy includes uncertainty from reference standards)[4]	±0.9% of S.P. (20-100% F.S.), ±0.18% of F.S. (<20% F.S)		±0.9% of S.P. (20-100% F.S.), ±0.18% of F.S. (2-20% F.S.) >1100 slpm F.S.: ±1.0% of F.S.
Control Range	100:1 for F.S. from 1-50 lpm (50:1 for all other F.S. flows)		
Repeatability & Reproducibility	0.20% S.P.		
Linearity	Included in accuracy		
Response Time (Settling Time within ±2% F.S. for 0-100% command step)	< 1 second		< 3 seconds
Zero Stability	< ± 0.2% F.S. per year		
Temperature Coefficient	Zero: <0.05% of F.S. per °C. Span: <0.1% of S.P. per °C		
Pressure Coefficient	±0.03% per psi (0-200 psi N_2)		
Attitude Sensitivity	<0.2% F.S. maximum deviation from specified accuracy after re-zeroing		
RATINGS			
Operating Temperature Range	-14 to 65°C (7 to 149°F)[6]		
Minimum Pressure Differential (Controllers)	5 psi/0.35 bar	10 psi/0.69 bar	Min.: 7.5 psi/0.52 bar at 500 lpm Min.: 14.5 psi/1.00 bar at 1000 lpm Min.: 35.0 psi/2.41 bar at 2500 lpm
Maximum Pressure Differential (Controllers)	Application specific up to 4500 psi/300 bar (limited conditions)[7]	50 psi/3.45 bar	300 psi/20.0 bar
Leak Integrity (external)	$1x10^{-9}$ atm. cc/sec He		
Valve Shut Down (leak by)[8]	<1% of FS		
MECHANICAL			
Valve Type	Normally Closed, Normally Open, Meter		
Primary Wetted Materials	316L Stainless Steel, High-Alloy Stainless Steel, Viton® fluoroelastomers (optional Buna-N, Kalrez®, Teflon®/Kalrez®, and EPDM)		
DIAGNOSTICS			
Status Lights	MFC Health, Network Status		
Alarms[5]	Control Valve Output, Flow Totalizer, Network Interruption, Over Temperature, Power Surge/Sag, Service Required		
Diagnostic/Service Port	RS485 via 2.5mm jack		

[4] Accuracy at calibration conditions

[5] Alarm modes are dependent on the communications interface. These are described in the corresponding digital communication interface manual.

[6] Hazardous area certifications have a temperature range limitation of 0-65°C.

[7] >1500 psi DP as a Special Order

[8] Metal and Teflon Seats <5% of Full Scale

Certifications - See Page 14

Electrical Specifications

Communication Protocol	RS485	Profibus®	DeviceNet™	EtherCAT®	EtherNet/IP™ & PROFINET
Electrical Connection	1 x 15-pin Male Sub-D, (A)	1 x 15-pin Male Sub-D/ 1 x 9-pin Female Sub-D	1 x M12 with threaded coupling nut (B)	1 x 5-pin M8 with threaded coupling nut 2 x RJ45	1 x 5-pin M8 with threaded coupling nut / 2 x RJ45
Analog I/O	0-5 V, 1-5 V, 0-10 V, 0-20 mA, 4-20 mA		N/A	0-5V	N/A
Power Max./Purge	From +13.5 Vdc to +27 Vdc		From +11 Vdc to +25 Vdc	From +13.5 Vdc to +27 Vdc	From +13.5 Vdc to +27 Vdc
Power Requirements Watts, Max.	Valve Orifice > 0.032": 8 W Valve Orifice ≤ 0.032": 5 W Without Valve: 2 W		Valve Orifice > 0.032": 10 W Valve Orifice ≤ 0.032": 7 W Without Valve: 4 W	Valve Orifice > 0.032": 8.5 W Valve Orifice ≤ 0.032": 5.5 W Without Valve: 2.5 W	Valve Orifice > 0.032": 10 W Valve Orifice ≤0.032": 7 W Without Valve:3 W
Web-based Network Settings Interface	N/A		N/A	N/A	The Default Network Address is 192.168.100.1 EtherNet/IP: Default Network Configuration is DHCP PROFINET: The Default Name is "sla-mfc"

	RS485	Profibus®
FLOW INPUT (VOLTAGE) SPECIFICATIONS		
Nominal Range	0-5 Vdc, 1-5 Vdc or 0-10 Vdc	
Full Range	(-0.5) -11 Vdc	
Absolute Max.	18 V (without damage)	
Input Impedence	>990 kOhms	
Required Max. Sink Current	0.002 mA	
FLOW INPUT (CURRENT) SPECIFICATIONS		
Nominal Range	4-20 mA or 0-20 mA	
Full Range	0-22 mA	
Absolute Max.	24 mA (without damage)	
Input Impedence	100 Ohms	
FLOW OUTPUT (VOLTAGE) SPECIFICATIONS		
Nominal Range	0-5 Vdc, 1-5 Vdc or 0-10 Vdc	
Full Range	(-1)-11 Vdc	
Min Load Resistance	2 kOhms	
FLOW OUTPUT (CURRENT) SPECIFICATIONS		
Nominal Range	0-20 mA or 4-20 mA	
Full Range	0-24.6 mA (@ 0-20 mA); 3.8-24.6 mA (@ 4-20 mA)	
Max. Load	380 Ohms (for supply voltage: < 16 Vdc)	
ANALOG I/O ALARM OUTPUT*		
Type	Open Collector	
Max. Closed (On) Current	25 mA	
Max. Open (Off) Leakage	1μA	
Max. Open (Off) Voltage	30 Vdc	
ANALOG I/O VALVE OVERRIDE SIGNAL SPECIFICATIONS**		
Floating/Unconnected	Instrument controls valve to command set point	
VOR < 0.3 Vdc	Valve Closed	
1 Vdc < VOR < 4 Vdc	Valve Normal	
VOR > 4.8 Vdc	Valve Open	
Input Impedence	800 kOhms	
Absolute Max. Input	(-25 Vdc) < VOR < 25 Vdc (without damage)	

*The Alarm Output is an open collector or "contact type" that is CLOSED (on) whenever an alarm is active. The Alarm Output may be set to indicate any one of various alarm conditions.

** The Valve Override Signal (VOR) is implemented as an analog input which measures the voltage at the input and controls the valve based upon the measured reading as shown in this section.

SLA5800 Series *Biotech*

Efficiency and simplicity combine to improve bioprocessing performance with the new SLA5800 Series *Biotech* MFC. It incorporates several features created specifically to help streamline MFC purchasing, improve process gas control, enhance flexibility and satisfy regulatory requirements.

To serve the unique requirements of your bioprocesses, Brooks Instrument has created two SLA5800 Series *Biotech* options packages, built on the proven performance of the bioprocess-leading SLA5800 Series MFC .

As noted in the ordering instructions, all options are combined into packages with convenient ordering codes, eliminating the need to order options individually.

SLA5800 Series *Biotech* Options Packages

Performance Package - Model Code S

Includes multiple performance enhancements reducing cost of operation

High Turndown Ratio	Reduces number of MFCs needed to control wide flow ranges
Enhanced Control Valve	Extremely low leak rate can eliminate need for redundant valves
Enhanced Sensor Design	Clean welded construction meets industry standards for cleanliness
Pre-calibrated Multi-Gas Pages[8]	Air, CO_2, N_2 &O_2 : gas pages can be changed in situ to reduce the variety of spare instruments kept in stock

Premium Package - Model Code T

Performance Package Features plus:

Includes premium materials and associated certificates tailored to industry requirements

Class VI Elastomers	USP, FDA, ADI-free Class VI O-rings & Valve Seats (Certificate Included)
Certifications	Materials of Construction (wetted path) 2.2 Material Cert[9] ICC CalibrationTraceability

[8] CO_2 Actual Gas Calibration available for SLA5850/60 & SLA5851/61. Use Model Code U for Performance Package, and Model Code V for Premium package.

[9] 3.1 Material Certs for pressure boundary components available as an option on Premium Package.
Note: All Communications protocols listed in the Electrical Specification Table, above, are available with any Biotech Option

Learn More About the SLA5800 Series *Biotech*

SLA5800 Series *Biotech*

Performance	SLA5850/60	SLA5851/61	SLA5853/63
Full Scale Flow Range (N_2, Eq.)	5 sccm -50 lpm	15 -150[1] lpm	100 -2500 lpm
Gasses Supported[2]	Air, CO_2, Nitrogen & Oxygen		
Flow Accuracy (accuracy includes linearity and calibration system uncertainty)[3]	±0.9% of S.P. (20-100% F.S.) ±0.18% of F.S. (< 20% F.S.)		±0.9% of S.P. (20-100% F.S.) ±0.18% of S.P. (0.67-20% F.S.) >1100 slpm F.S. ±1.0% of F.S.
Repeatability & Reproducibility	0.20% S.P.		
Turndown (control range)	250:1	250:1	150:1
Response Time	< 1 Second	< 1 Second	< 3 Seconds
Zero Stability	< ± 0.2% F.S. per year		
Temperature Coefficient	<0.05% F.S. per °C		
Valve Shut Down (leak-by)	0.005 sccm		15.6 sccm

1 Maximum flow depends on pressure conditions; consult Applications Engineering for details
2 Calibration on CO_2 available as an option on SLA5850/60 & SLA5851/61
3 Accuracy at Calibration Conditions

Ratings	SLA5850/60	SLA5851/61	SLA5853/63
Inlet Pressure Range[4]:	5 psig to 60 psig	10 psig to 60 psig	8 psig to 60 psig
Outlet Pressure Range:	Atmospheric	Atmospheric	Atmospheric
Maximum Pressure	Same as standard		
Differential Pressure (controller only)	60 psig[5]		
Valve Configuration	Standard SLA with Special Factory Tuning/Normally Closed		
Ambient Temperature Range	-14˚C - 50˚C		
Sensor Design	Enhanced construction to meet industry standards for cleanliness		

4 Performance at minimum inlet pressure will be gas and flow range dependent. Consult Application Engineering for details.
5 Maximum pressure drop. Actual pressure drop will be gas and flow dependent. Consult Application engineering for details.

Code Description	Code Option	Option Description
Biotech Options Packages	S	Performance Package[6]
	T	Premium Package[7]
	U	Performance Package with CO_2 Calibration[8]
	V	Premium Package with CO_2 Calibration[8]

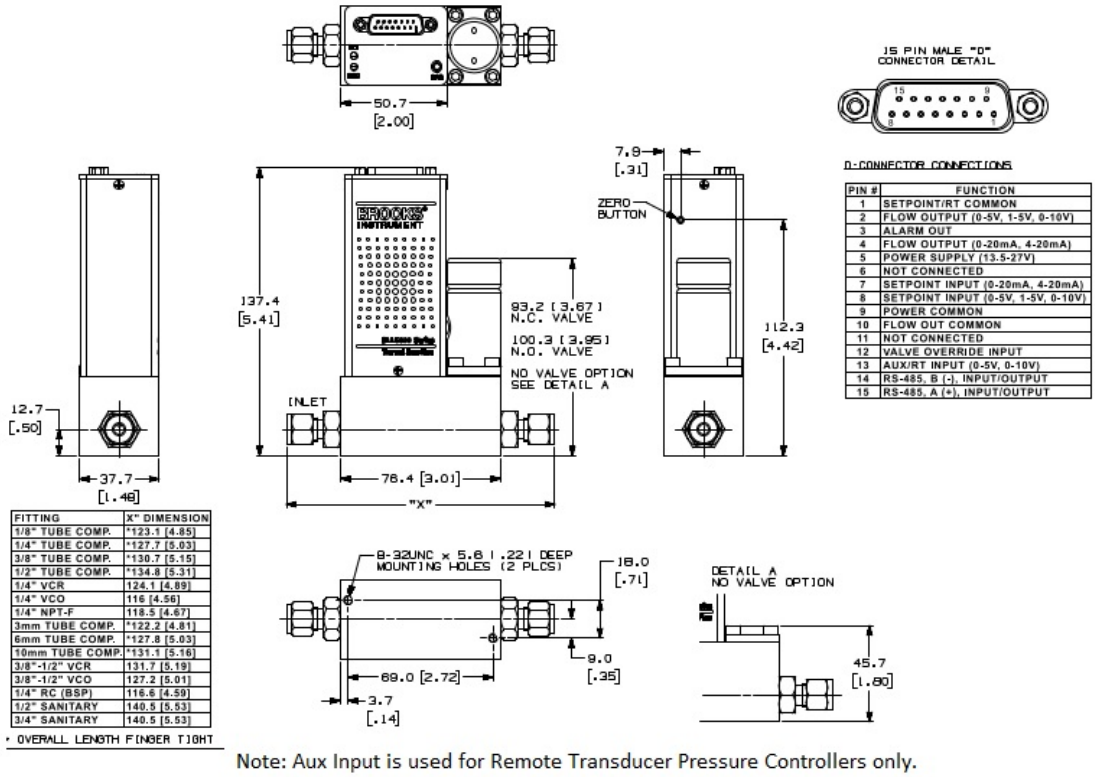
[6] Performance Package must be ordered for basic *Biotech* model features;

[7] Premium Package includes Performance Package features.

[8] Not available on SLA5853 or SLA5863

Learn More About
the SLA5800 Series *Biotech*

SLA5850, Thru-Flow, RS485



PIN #	FUNCTION
1	SETPOINT/RT COMMON
2	FLOW OUTPUT (0-5V, 1-5V, 0-10V)
3	ALARM OUT
4	FLOW OUTPUT (0-20mA, 4-20mA)
5	POWER SUPPLY (13.5-27V)
6	NOT CONNECTED
7	SETPOINT INPUT (0-20mA, 4-20mA)
8	SETPOINT INPUT (0-5V, 1-5V, 0-10V)
9	POWER COMMON
10	FLOW OUT COMMON
11	NOT CONNECTED
12	VALVE OVERRIDE INPUT
13	AUX/RT INPUT (0-5V, 0-10V)
14	RS-485, B (-), INPUT/OUTPUT
15	RS-485, A (+), INPUT/OUTPUT

FITTING	"X" DIMENSION
1/8" TUBE COMP.	*123.1 [4.85]
1/4" TUBE COMP.	*127.7 [5.03]
3/8" TUBE COMP.	*130.7 [5.15]
1/2" TUBE COMP.	*134.8 [5.31]
1/4" VCR	124.1 [4.89]
1/4" VCO	116 [4.56]
1/4" NPT-F	118.5 [4.67]
3mm TUBE COMP.	*122.2 [4.81]
6mm TUBE COMP.	*127.8 [5.03]
10mm TUBE COMP.	*131.1 [5.16]
3/8"-1/2" VCR	131.7 [5.19]
3/8"-1/2" VCO	127.2 [5.01]
1/4" RC (BSP)	116.6 [4.59]
1/2" SANITARY	140.5 [5.53]
3/4" SANITARY	140.5 [5.53]

* OVERALL LENGTH FINGER TIGHT

Note: Aux Input is used for Remote Transducer Pressure Controllers only.

SLA58500031 D

Dimensional drawings for additional configurations are available in the corresponding Dimensional Drawing Quick Reference Guide or the Installation & Operation Manual.

Access our library of CAD Drawings

Code Description	Code Option	Option Description[1]
I. Base Model Numbers	SLA	
II. Package / Finish Specifications	58	Standard Elastomer Series
III. Function	5	Mass Flow Controller
	6	Mass Flow Meter
IV. Gas or Range	0	3 ccm - 50 lpm
	1	20 - 100 lpm
	3	100 - 2500 lpm
V. Digital I/O Communication	A	None (select applicable analog I/O)
	D	DeviceNet I/O (with 5-pin micro connector)
	E	EtherCAT I/O (with 5-pin Nano-change connector)
	P	Profibus (2x sub-D)
	S	RS485 (select applicable analog I/O)
	7	EtherNET/IP™ I/O (with 5 Pin Nano-change M8 Connector)
	8	PROFINET (with 5 Pin Nano-change M8 Connector)
VI. Mechanical Connection (Body size 0 & 1 only)	1A	Without adapters, 9/16" - 18 UNF
	1B	1/4" tube compression
	1C	1/8" tube compression
	1D	3/8" tube compression
	1E	1/4" VCR
	1F	1/4" VCO
	1G	1/4" NPT
	1H	6mm tube compression
	1J	10mm tube compression
	1L	3/8"-1/2" VCR
	1M	3/8"-1/2" VCO
	1P	1/2" tube compression
	1S	Elastomer downport
	1T	1/4" RC (BSP)
	1Y	3mm tube compression
	B1	1/4" tube compression w/Filter
	C1	1/8" tube compression w/Filter
	D1	3/8" tube compression w/Filter
	E1	1/4" VCR w/Filter
	F1	1/4" VCO w/Filter
	G1	1/4" NPT w/Filter
	H1	6mm tube compression w/Filter
	J1	10mm tube compression w/Filter
	L1	3/8"-1/2" VCR w/Filter
	M1	3/8"-1/2" VCO w/Filter
	P1	1/2" tube compression w/Filter
	T1	1/4" RC (BSP) w/Filter
	Y1	3mm tube compression w/Filter
	5A[2]	9/16-18 X 1/2" Sanitary
	5B[2]	9/16 -48 X 3/4" Sanitary
VI. Mechanical Connection (Body size 3 only)	2A	Without adapters, 9/16" - 18 UNF
	2B	1-1/16"-12 SAE/MS
	2C	3/8" tube compression
	2D	1/2" tube compression
	2E	3/4" tube compression
	2F	1" tube compression
	2G	1/2" NPT (F)
	2H	1" NPT (F)
	2J	1-1/2" NPT (F)
	2K	1/2" VCO
	2L	3/4" VCO
	2M	1/2" VCR
	2N	1/2" RC (BSP)
	2P	1" RC (BSP)
	2R	1-5/16"-12 SAE/MS
	2S	1" VCO
	2T	3/4" VCR
	2U	1" VCR
	3A	DIN DN15 PN40 Flange
	3B	DIN DN25 PN40 Flange
	3C	DIN DN40 PN40 Flange
	3D	DIN DN50 PN40 Flange
	5C[2]	1 1/16-12 X 1/2" Sanitary
	5D[2]	11/16-12 X 3/4" Sanitary
	5E[2]	1 1/16-12 X 1" Sanitary

Code Description	Code Option	Option Description[1]
VI. Mechanical Connection (Body size 3 only)[2]	3E	ANSI 1/2" 150# RF Flange
	3F	ANSI 1/2" 300# RF Flange
	3G	ANSI 1" 150# RF Flange
	3H	ANSI 1" 300# RF Flange
	3J	ANSI 1-1/2" 150# RF Flange
	3K	ANSI 1-1/2" 300# RF Flange
VII. O-ring Material	A	Viton
	B	Buna
	C	PTFE
	D	Kalrez
	E	EPDM
	J	FDA/USP Class VI - Viton
	L	FDA/USP Class VI - EPDM
VIII. Valve Seat	A	None (Sensor only)
	B	Viton (for body size 3, diaphragm material = PTFE)
	C	Buna (for body size 3, diaphragm material = PTFE)
	D	Kalrez (for body size 3, diaphragm material = PTFE)
	E	EPDM (for body size 3, diaphragm material = PTFE)
	F	PTFE
	G	Metal (for body size 3, diaphragm material = PTFE)
IX. Valve Type	0	None (Sensor only)
	1	Normally closed
	2	Normally closed (Pressure diff. >30 psig (2 bar))
	3	Normally closed (Pressure diff.<30 psig (2 bar))
	4	Normally closed - high pressure
	5	Normally open
X. Analog I/O Communications	A	None - Digital Communications only
	B	0-5 Volt 0-5 Volt 15-pin D-conn
	C	4-20 mA 4-20 mA 15-pin D-conn
	L	1-5 Volt 1-5 Volt 15-pin D-conn
	M	0-20 mA 0-20 mA 15-pin D-conn
	0	0-10 Volt 0-10 Volt 15-pin D-conn
	1	0-5 Volt 4-20 mA 15-pin D-conn
	2	0-5 Volt 0-20 mA 15-pin D-conn
	3	4-20 mA 0-5 Volt 15-pin D-conn
	4	0-20 mA 0-5 Volt 15-pin D-conn
	9	0-10 Volt 0-5 Volt 15-pin D-conn
XI. Power Supply Inputs	1	+15 Vdc
	2	24 Vdc
XII. Output Enhancements	A	Standard response
XIII. Certification	1	Safe Area
	2	For Zone 2 ATEX/IECEx
	4	Div. 2/Zone 2 UL Recognized

Sample Standard Model Code

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
SLA	58	5	0	A	1A	A	B	1	B	1	A	1

1 See Page 5 for *Biotech* Model Code Options
2 Sanitary Fittings Model Code 5A, 5B, 5C, 5D and 5E are limited to 500 PSI Maximum Pressure

Request a Quote

Certifications

Mark	Agency	Certification	Applicable Standard	Details
c UL us	UL (Recogonized)	Class I, Div 2, Group A, B, C, D Class I, Zone 2, IIC T4 Class II, Zone 22	UL & CSA Standards	E73889 Vol 3, Sec 4
Ex	ATEX	II 3 G Ex nA IIC T4 Gc	EN60079-0:2012 EN 60079-15:2010	KEMA 04ATEX 1118X
	IECEx	II 3 G Ex nA IIC T4 Gc	IEC 60079-0:2011 IEC 60079-15:2010	IECEx DEK 14.0072X
KCs	KOSHA	Ex nA IIC T4		15-AV4BO-0641 15-AV4BO-0640
CE	CE	EMC Directive 2014/30/EU Directive 2011/65/EU	EN:61326-1:2013	EMC RoHS

ATEX/IECEx Special Conditions: please see Certification section of the SLA5800 Installation & Operation Manual

Service and Support

Brooks is committed to assuring all of our customers receive the ideal flow solution for their application, along with outstanding service and support to back it up. We operate first class repair facilities located around the world to provide rapid response and support. Each location utilizes primary standard calibration equipment to ensure accuracy and reliability for repairs and recalibration and is certified by our local Weights and Measures Authorities and traceable to the relevant International Standards.

Visit www.BrooksInstrument.com to locate the service location nearest to you.

START-UP SERVICE AND IN-SITU CALIBRATION

Brooks Instrument can provide start-up service prior to operation when required. For some process applications, where ISO-9001 Quality Certification is important, it is mandatory to verify and/or (re)calibrate the products periodically. In many cases this service can be provided under in-situ conditions, and the results will be traceable to the relevant international quality standards.

CUSTOMER SEMINARS AND TRAINING

Brooks Instrument can provide customer seminars and dedicated training to engineers, end users, and maintenance persons. Please contact your nearest sales representative for more details. Due to Brooks Instrument's commitment to continuous improvement of our products, all specifications are subject to change without notice.

DS-TMF-SLA5800-Series-RevB-MFC-eng/2019-12

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A list of all Brooks Instrument locations and contact details can be found at www.BrooksInstrument.com

BROOKS® INSTRUMENT
Beyond Measure

DATA SHEET

Mass Flow Controllers & Meters

SLAMf Series

Elastomer Sealed, Digital, Gas Mass Flow Controllers & Meters for Hosedown/Washdown Hazardous Area Applications

Whether it's dust, moisture, temperature extremes or washdown requirements, the SLAMf Series thermal mass flow controllers and meters deliver the precise accuracy and long-term stability of our proven SLA5800 family of meters and controllers. A specially engineered IP66 enclosure protects our advanced digital electronics and ensures stable, accurate measurement and control of your process-critical gas and liquid mass flows. The SLAMf Series is well suited for chemical and petrochemical research, laboratory, analytical, fuel cell, biotechnology, and life science applications, among others.

Highlights of the SLAMf Series mass flow products include: industry leading long term stability; accuracy backed by superior 17025 metrology systems and methods using primary calibration systems directly traceable to international standards, and a broad range of analog and digital I/O options to suit virtually any application. An independent diagnostic/service port permits users to set alarms and diagnostics, tune, troubleshoot or change flow conditions without removing the mass flow controller from service.

The SLAMf Series provides a highly configurable platform based on a simple modular architecture. The feature set was carefully selected to enable drop-in replacement and upgrade of many brands of mass flow controllers. With the wide range of features and options available, the SLAMf Series provides users with a single platform to support a broad range of applications.

Features	Benefits
IP66 rated hardened enclosure	Ensures process accuracy and control in harsh conditions (equivalent to NEMA4X)
Industry-leading long-term sensor stability	Increased system uptime and reduced cost of ownership by reducing maintenance and eliminating periodic recipe adjustments and/or recalibrations
User accessible service port	Simplified installation, start-up, troubleshooting and access to diagnostics provides maximum uptime
Alarms and diagnostics	Ensures device is operating within user specified limits for high process yield uptime
Superior valve technology	Minimum leak-by, wide turndown, fast response and superior corrosion resistant materials reduces overall gas panel cost and increases throughput
High accuracy traceable to international standards	Calibration by verified metrology systems ensures precise process gas flow control
Simple modular design	Easy-to-service elastomer sealed design provides for factory or field service maximizing uptime and reducing total cost of ownership

View SLAMf Product Page

Superior Thermal Flow Measurement Sensor

Brooks' sensor technology combines:

- Excellent signal to noise performance for good accuracy at low setpoints
- Superior long-term stability through enhanced sensor design, manufacturing and extensive burn-in process
- Isothermal packaging to reduce sensitivity to external temperature changes
- Corrosion resistant sensor flow path

Advanced Diagnostics

The mass flow controller remains the most complex and critical component in gas delivery systems. When dealing with highly toxic or corrosive gases, removing the mass flow controller to determine if it is faulty should be the last resort. In response to this, Brooks pioneered smarter mass flow controllers with embedded self-test routines and introduced an independent diagnostic/ service port to provide the user with a simple interface, for troubleshooting without disturbing flow controller operation.

IP66 Rating

The SLAMf Series provides the highest rated enclosure: IP66 Ingress Protection (equivalent to NEMA4X). These are used to define levels of sealing effectiveness of electrical enclosures against intrusion from foreign bodies (tools, dirt etc.) and moisture.

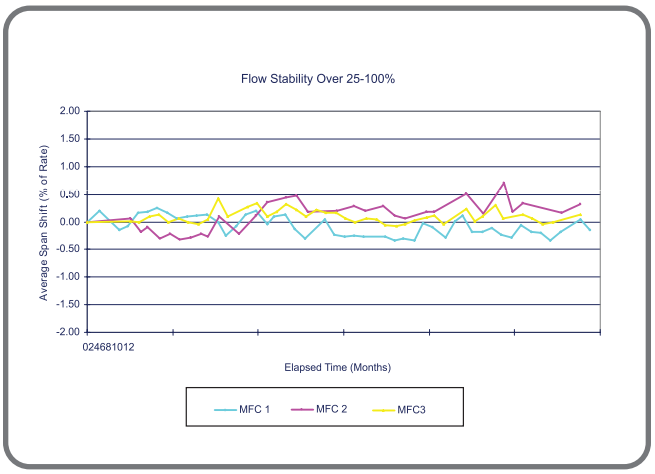
- IP66 Enclosure - IP rated as "dust tight" and protected against heavy seas or powerful jets of water.
- NEMA4X is intended mainly for outdoor use where extra protection against moisture and wind driven rain is required.

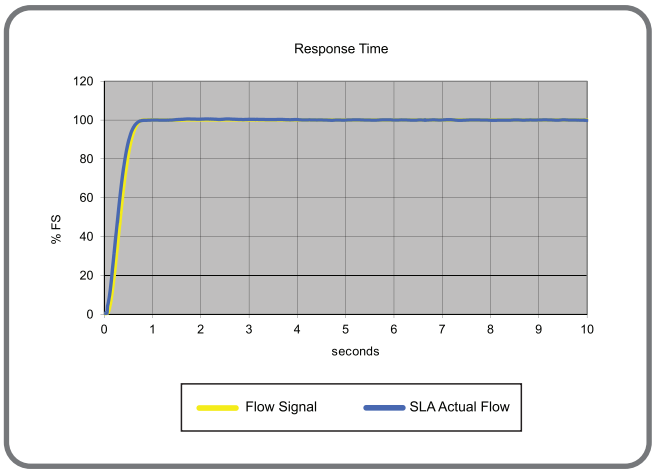
Broad Array of Communication Options

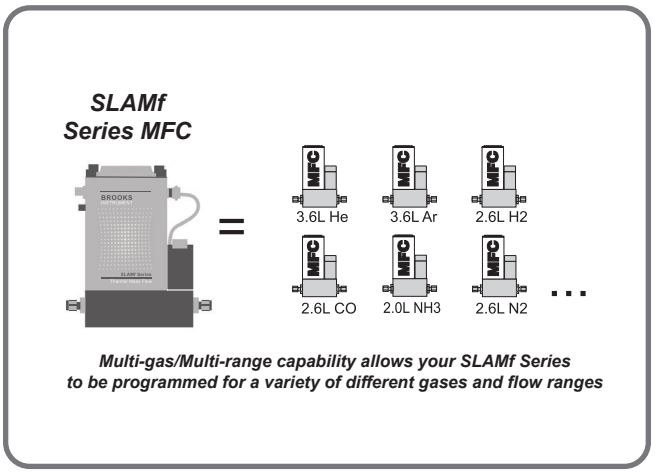
Traditional 0-5 Vdc and 4-20mA analog options as well as RS485 digital communications are available ("S-protocol", based on HART). Control interfaces via digital network protocols including EtherNet/IP™, PROFINET, DeviceNet®, and Profibus® are also available . EtherNet/IP™ and PROFINET are a modern, high-speed digital protocol that permits multiple , additional diagnostics to provide MFC users with rich, real-time system information. DeviceNet® has been certified by the ODVA (Open DeviceNet Vendor's Association). EtherNET/IP™ and PROFINET are pending industry conformance certification.

Multi-gas/Multi-range Capabilities

The SLAMf Series multi-gas and multi-range capabilities reduce inventory. Storage and pre-programming of up to 6 gas calibrations easily permits users to switch between different gasses and ranges on a single device.







Multi-gas/Multi-range capability allows your SLAMf Series to be programmed for a variety of different gases and flow ranges

SLAMf Series Standard

Flow Ranges and Pressure Ratings:

Mass Flow Controller Model	Mass Flow Meter Model	Flow Ranges N2 Eq. Ratings		Maximum Operating Pressure psi/bar		PED Module H Category
		Min. F.S.	Max. F.S.	Standard[1]	Optional[1]	
SLAMf50	SLAMf60	0.003	50 lpm	1500 psi/103 bar	4500 psi/310 bar	SEP
SLAMf51	SLAMf61	15	150 lpm[2]	1500 psi/103 bar[3]	NA[4]	SEP
SLAMf53	SLAMf63	100	2500 lpm	1000 psi/70 bar	NA	1 for all 150 lb flanges 2 for all other connections
-	SLAMf64	18	2160 m^3/h	Flow rate dependant		1-1/2" - 100 bar 2" & 3" - 85 bar 4" & 6" - 70 bar 8" - 50 bar

[1] Sanitary fittings - Model code 5A, 5B, 5C, 5D & 5E rated to 500 psi Maximum Pressure (see Table VI on page 12)
[2] 600 lpm of H2 possible with decreased accuracy. Greater than 40 psig inlet required for flows greater than 100 lpm N_2 equivalent
[3] 1000 psi/70 bar for UL Certificate
[4] 4500 psi/310 bar available as a special on SLAMf61 only

	SLAMf50/60	SLAMf51/61	SLAMf53/63	SLAMf64
PERFORMANCE				
Flow Accuracy (accuracy includes uncertainty from reference standards)[5]	±0.9% of S.P. (20-100% F.S.), +0.18% of F.S. (<20% F.S.)		±0.9% of S.P. (20-100% F.S.), ±0.18% of F.S. (2-20% F.S.) >1100 slpm F.S. ±1.0% of F.S.	±1% F.S.
Control Range	100:1 for F.S. from 1-50 lpm (50:1 for all other F.S. flows)			N/A
Repeatability & Reproducibility	0.20% S.P.			±0.25% S.P.
Linearity	Included in accuracy			
Response Time (Settling Time within ±2% F.S. for 0-100% command step)	< 1 second		< 3 seconds	N/A
Zero Stability	< ± 0.2% F.S. per year			
Temperature Coefficient	Zero: <0.05% of F.S. per °C. Span: < 0.1% of S.P. per °C			
Pressure Coefficient	±0.03% per psi (0-200 psi N2)			
Attitude Sensitivity	<0.2% F.S. maximum deviation from specified accuracy after re-zeroing			

[5] Accuracy at calibration conditions

RATINGS				
Operating Temperature Range	-14 to 65°C (7 to 149°F)[7]			
Minimum Pressure Differential (Controllers)	5 psi/0.35 bar	10 psi/0.69 bar	Min.: 11.7 psi/0.81 bar at 500 lpm Min.: 14.5 psi/1.00 bar at 1000 lpm Min.: 35.0 psi/2.41 bar at 2500 lpm	N/A
Maximum Pressure Differential (Controllers)	Application specific up to 1500 psi/103.4 bar[8]	50 psi/3.45 bar	300 psi/20.0 bar	N/A
Leak Integrity (external)	$1x10^{-9}$ atm. cc/sec He			
Valve Shut Down (leak by)[9,10]	<1% of F.S.			N/A
MECHANICAL				
Valve Type	Normally Closed, Normally Open, Meter			N/A
Primary Wetted Materials	316L Stainless Steel, High Alloy Stainless Steel, Viton® fluoroelastomers, Buna-N, Kalrez®, Teflon®/Kalrez®, and EPDM			
DIAGNOSTICS				
Status Lights	MFC Health, Network Status			
Alarms [6]	Control Valve Output, Flow Totalizer, Network Interruption, Over Temperature, Power Surge/Sag, Service Required			
Diagnostic/Service Port	RS485 via 2.5mm jack			

[6] Alarm modes are dependent on the communications interface. These are described in the corresponding digital communication interface manual.
[7] Hazardous area certifications have a temperature range limitation of 0-65°C.
[8] >1500 PSI DP as a Special Order
[9] Metal and Teflon Seats are <5% of Full Scale
[10] Leak-by and valve shutdown specs for normally closed valve type.

Electrical Specifications

Communication Protocol	RS485	Profibus®	DeviceNet™	EtherNet/IP™ & PROFINET
Electrical Connection	1 x 15-pin Male Sub-D, (A)	1 x 15-pin Male Sub-D/ 1 x 9-pin Female Sub-D	1 x M12 with threaded coupling nut (B)	1x 5-pin M8 Male Nano Change Connector / 2x 4-pin M12 Female D Coded Connector
Analog I/O	0-5 V, 1-5 V, 0-10 V, 0-20 mA, 4-20 mA		N/A	N/A
Power Max./Purge	From +13.5 Vdc to +27 Vdc		From +11 Vdc to +25 Vdc	From +13.5 Vdc to +27 Vdc
Power Requirements Watts, Max.	Valve Orifice > 0.032": 8 W Valve Orifice ≤ 0.032": 5 W Without Valve: 2 W		Valve Orifice > 0.032": 10 W Valve Orifice ≤ 0.032": 7 W Without Valve: 4 W	Valve Orifice > 0.032": 11 W Valve Orifice ≤ 0.032": 7 W Without Valve:3W
Embedded Browser Interface	N/A		N/A	The Default Network Address is 192.168.100.1 EtherNet/IP: Default Network Configuration is DHCP PROFINET: The Default Name is "sla-mfc"

FLOW INPUT (VOLTAGE) SPECIFICATIONS	
Nominal Range	0-5 Vdc, 1-5 Vdc or 0-10 Vdc
Full Range	(-0.5) -11 Vdc
Absolute Max.	18 V (without damage)
Input Impedence	>990 kOhms
Required Max. Sink Current	0.002 mA

FLOW INPUT (CURRENT) SPECIFICATIONS	
Nominal Range	4-20 mA or 0-20 mA
Full Range	0-22 mA
Absolute Max.	24 mA (without damage)
Input Impedence	100 Ohms

FLOW OUTPUT (VOLTAGE) SPECIFICATIONS	
Nominal Range	0-5 Vdc, 1-5 Vdc or 0-10 Vdc
Full Range	(-1)-11 Vdc
Min Load Resistance	2 kOhms

FLOW OUTPUT (CURRENT) SPECIFICATIONS	
Nominal Range	0-20 mA or 4-20 mA
Full Range	0-22 mA (@ 0-20 mA); 3.8-22 mA (@ 4-20 mA)
Max. Load	380 Ohms (for supply voltage: < 16 Vdc)

ANALOG I/O ALARM OUTPUT*	
Type	Open Collector
Max. Closed (On) Current	25 mA
Max. Open (Off) Leakage	1µA
Max. Open (Off) Voltage	30 Vdc

ANALOG I/O VALVE OVERRIDE SIGNAL SPECIFICATIONS**	
Floating/Unconnected	Instrument controls valve to command set point
VOR < 0.3 Vdc	Valve Closed
1 Vdc < VOR < 4 Vdc	Valve Normal
VOR > 4.8 Vdc	Valve Open
Input Impedence	800 kOhms
Absolute Max. Input	(-25 Vdc) < VOR < 25 Vdc (without damage)

* The Alarm Output is an open collector or "contact type" that is CLOSED (on) whenever an alarm is active. The Alarm Output may be set to indicate any one of various alarm conditions.

** The Valve Override Signal (VOR) is implemented as an analog input which measures the voltage at the input and controls the valve based upon the measured reading as shown in this section.

SLAMf Series *Biotech*

Efficiency and simplicity combine to improve bioprocessing performance with the new SLAMf Series *Biotech* MFC. It incorporates several features created specifically to help streamline MFC purchasing, improve process gas control, enhance flexibility and satisfy regulatory requirements.

To serve the unique requirements of your bioprocesses, Brooks Instrument has created two SLAMf Series *Biotech* options packages, built on the proven performance of the bioprocess-leading SLAMf Series MFC .

As noted in the ordering instructions, all options are combined into packages with convenient ordering codes, eliminating the need to order options individually.

The *Biotech* Options Packages are not available on SLAMF64.

SLAMf Series *Biotech* Options Packages

Performance Package - Model Code S	
Includes multiple performance enhancements reducing cost of operation	
High Turndown Ratio	Reduces number of MFCs needed to control wide flow ranges
Enhanced Control Valve	Extremely low leak rate can eliminate need for redundant valves
Enhanced Sensor Design	Clean welded construction meets industry standards for cleanliness
Pre-calibrated Multi-Gas Pages[12]	Air, CO_2, N_2 & O_2 : gas pages can be changed in situ to reduce the variety of spare instruments kept in stock
Premium Package - Model Code T	
Performance Package Features plus:	
Includes premium materials and associated certificates tailored to industry requirements	
Class VI Elastomers	USP, FDA, ADI-free Class VI O-rings & Valve Seats (Certificate Included)
Certifications	Materials of Construction (wetted path) 2.2 Material Cert[13] ICC CalibrationTraceability

[12] CO_2 Actual Gas Calibration available for SLAMf50/60 & SLAMf51/61. Use Model Code U for Performance Package, and Model Code V for Premium package.

[13] 3.1 Material Certs for pressure boundary components available as an option on Premium Package.

Learn More About the SLAMf Series *Biotech*

SLAMf Series *Biotech*

Performance	SLAMf50/60		SLAMf51/61		SLAMf53/63	
	Min. F.S.	Max. F.S.	Min. F.S.	Max. F.S.	Min. F.S.	Max F.S.
Available Flow Ranges (N_2, Eq)[4]	5 sccm	50 lpm	15 lpm	150[1] lpm	100 lpm	2500 lpm
Gasses Supported[2]	Air, CO_2, Nitrogen & Oxygen					
Flow Accuracy (accuracy includes linearity and calibration system uncertainty)[3]	±0.9% of S.P. (20-100% F.S.) ±0.18% of F.S. (<20% F.S.)				±0.9% of S.P. (20-100% F.S.) ±0.18% of S.P. (0.67-20% F.S.) >1100 slpm F.S. ±1.0% of F.S.	
Repeatability & Reproducibility	0.20% S.P.					
Turndown (control range)	250:1		250:1		150:1	
Response Time	< 1 Second		< 1 Second		< 3 Seconds	
Zero Stability	< ± 0.2% F.S. per year					
Temperature Coefficient	<0.05% F.S. per °C					
Valve Shut Down (leak-by)	0.005 sccm				15.6 sccm	

1 Maximum flow depends on pressure conditions; consult applications engineering for details
2 Calibration on CO_2 available as an option on SLAMf50/60 & SLAMf51/61
3 Accuracy at Calibration Conditions
4 Available Range defines the minimum full scale flow and maximum full scale flow available for each body size

Ratings	SLAMf50/60	SLAMf51/61	SLAMf53/63
Inlet Pressure Range:[5]	5 psig to 60 psig	10 psig to 60 psig	8 psig to 60 psig
Outlet pressure range:	Atmospheric	Atmospheric	Atmospheric
Maximum Pressure	Same as standard		
Differential Pressure (Controller Only)	60 psig[6]		
Valve Configuration	Standard SLA with Special Factory Tuning/Normally Closed		
Ambient Temperature Range	-14˚C - 50˚C		
Sensor Design	Enhanced construction to meet industry standards for cleanliness		

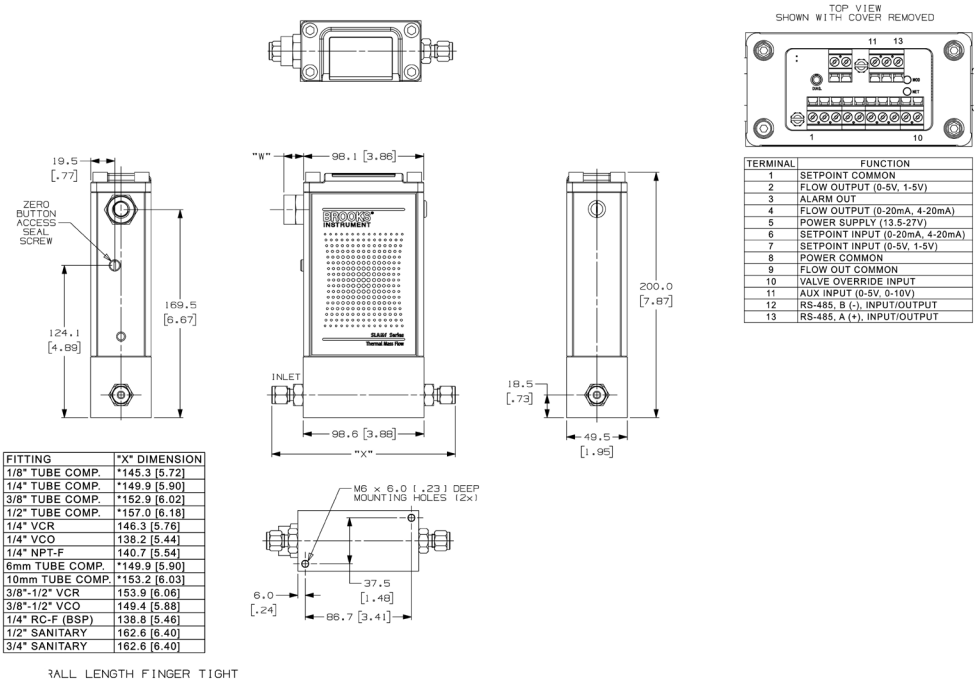
5 Performance at minimum inlet pressure will be gas and flow range dependent. Consult Applications Engineering for details.
6 Maximum pressure drop. Actual pressure drop will be gas and flow dependent. Consult Applications Engineering for details.

Code Description	Code Option	Option Description
Biotech Options Packages	S	Performance Package [A]
	T	Premium Package [B]
	U	Performance Package with CO_2 Calibration [C]
	V	Premium Package with CO_2 Calibration [C]

A Performance Package must be ordered for basic *Biotech* model features;
B Premium Package includes Performance Package features.
C Not available on SLAMf53 or SLAMf63

Learn More About
the SLAMf Series *Biotech*

SLAMf60, Analog/RS485



TERMINAL	FUNCTION
1	SETPOINT COMMON
2	FLOW OUTPUT (0-5V, 1-5V)
3	ALARM OUT
4	FLOW OUTPUT (0-20mA, 4-20mA)
5	POWER SUPPLY (13.5-27V)
6	SETPOINT INPUT (0-20mA, 4-20mA)
7	SETPOINT INPUT (0-5V, 1-5V)
8	POWER COMMON
9	FLOW OUT COMMON
10	VALVE OVERRIDE INPUT
11	AUX INPUT (0-5V, 0-10V)
12	RS-485, B (-), INPUT/OUTPUT
13	RS-485, A (+), INPUT/OUTPUT

FITTING	"X" DIMENSION
1/8" TUBE COMP.	*145.3 [5.72]
1/4" TUBE COMP.	*149.9 [5.90]
3/8" TUBE COMP.	*152.9 [6.02]
1/2" TUBE COMP.	*157.0 [6.18]
1/4" VCR	146.3 [5.76]
1/4" VCO	138.2 [5.44]
1/4" NPT-F	140.7 [5.54]
6mm TUBE COMP.	*149.9 [5.90]
10mm TUBE COMP.	*153.2 [6.03]
3/8"-1/2" VCR	153.9 [6.06]
3/8"-1/2" VCO	149.4 [5.88]
1/4" RC-F (BSP)	138.8 [5.46]
1/2" SANITARY	162.6 [6.40]
3/4" SANITARY	162.6 [6.40]

?ALL LENGTH FINGER TIGHT

SLAMf60031B

Dimensional drawings for additional configurations are available in the corresponding Dimensional DrawingQuick Reference Guide or the Installation & Operation Manual

Access our library of CAD Drawings

Certifications

Mark	Agency	Certification	Applicable Standard	Details
	UL (Recogonized)	Class I, Div 2, Group A, B, C, D Class I, Zone 2, IIC T4 Class II, Zone 22 IP66	UL & CSA Standards	E73889 Vol 3, Sec 4
	UL (Listed)	Class I, Div 2, Group A, B, C, D Class I, Zone 2, IIC T4 Class II, Zone 22 IP66	UL & CSA Standards	E73889 Vol 1, Sec 25
	ATEX	II 3 G Ex nA IIC T4 Gc II 3 D Ex tc IIIC T 85 °C Dc IP66	EN 60079-0 : 2012 + A11 : 2013 EN 60079-15 : 2010 EN 60079-31 : 2014	KEMA 04ATEX1290 X
	IECEx	Ex nA IIC T4 Gc Ex tc IIIC T 85 °C Dc IP66	IEC 60079-0 : 2011 + Corr. 2012 + Cor. 2013 IEC 60079-15 : 2010 IEC 60079-31 : 2013	IEC KEM 07.0043X
	KOSHA	Ex nA IIC T4 Ex tD A22 IP66 T85°C		15-AV4BO-0638 15-AV4BO-0639 16-AV4BO-0328X 16-AV4BO-0327X
CE	CE	EMC Directive 2014/30/EU Directive 2011/65/EU	EN:61326-1:2013	EMC RoHS

Note:

1). Not all certifications are available for all SLAMF specifications and configurations.

2). EtherNET/IP & PROFINET configurations are available with IP-66 rating ONLY. No other UL, ATEX, IECEx or KOSHA ratings are available (CE is available with EtherNet/IP & PROFINET) Please contact Customer Service for details.

Code Description	Code Option	Option Description[1]
I. Base Model Numbers	SLA	
II. Package / Finish Specifications	MF	Standard Elastomer Series
III. Function	5	Mass Flow Controller
	6	Mass Flow Meter
IV. Body Size	0	3 ccm - 50 lpm N_2 Equivalent
	1	20 - 100 lpm N_2 Equivalent
	3	100 - 2500 lpm N_2 Equivalent
	4	300 - 36000 lpm N_2 Equivalent
V. Digital I/O Communication	A	None (select applicable analog I/O)
	D	DeviceNet I/O (with 5-pin micro connector)
	E	EtherCAT
	J	DeviceNet I/O (with PG11 cable gland)
	K	DeviceNet I/O (with M20x1.5 conduit)
	L	DeviceNet I/O (with 1/2" NPT (F) conduit)
	P	Profibus (5-pin female M12, M20x1.5 conduit)
	R	Profibus (5-pin female M12, PG11 cable gland)
	T	Profibus (5-pin female M12, 1/2" NPT (F) conduit)
	S	RS485 (select applicable analog I/O)
	7	EtherNET/IP (5-pin M8 Male Nano; 2X M12 Female D coded Connector)
	8	PROFINET (5-pin M8 Male Nano; 2X M12 Female D coded Connector)
VI. Mechanical Connection (Body size 0 & 1 only)	1A	Without adapters, 9/16" - 18 UNF
	1B	1/4" tube compression
	1C	1/8" tube compression
	1D	3/8" tube compression
	1E	1/4" VCR
	1F	1/4" VCO
	1G	1/4" NPT
	1H	6mm tube compression
	1J	10mm tube compression
	1L	3/8"-1/2" VCR
	1M	3/8"-1/2" VCO
	1P	1/2" tube compression
	1T	1/4" RC (BSP)
	1Y	3mm tube compression
	B1	1/4" tube compression w/Filter
	C1	1/8" tube compression w/Filter
	D1	3/8" tube compression w/Filter
	E1	1/4" VCR w/Filter
	F1	1/4" VCO w/Filter
	G1	1/4" NPT w/Filter
	H1	6mm tube compression w/Filter
	J1	10mm tube compression w/Filter
	L1	3/8"-1/2" VCR w/Filter
	M1	3/8"-1/2" VCO w/Filter
	P1	1/2" tube compression w/Filter
	T1	1/4" RC (BSP) w/Filter
	Y1[2]	3mm tube compression w/Filter
	5A[2]	9/16-18 X 1/2" Sanitary
	5B	9/16 -48 X 3/4" Sanitary
VI. Mechanical Connection (Body size 3 unless noted Size 4 only. Size 4 noted)	2A	Without adapters, 9/16" - 18 UNF
	2B	1-1/16"-12 SAE/MS
	2C	3/8" tube compression
	2D	1/2" tube compression
	2E	3/4" tube compression
	2F	1" tube compression
	2G	1/2" NPT (F)
	2H	1" NPT (F)
	2J	1-1/2" NPT (F) (Size 3 & 4)
	2K	1/2" VCO
	2L	3/4" VCO
	2M	1/2" VCR
	2N	1/2" RC (BSP)
	2P	1" RC (BSP)
	2R	1-5/16"-12 SAE/MS
	2S	1" VCO
	2T	3/4" VCR
	2U	1" VCR
	2W	2" NPT Size 4 only
	2X[2]	12 mm tube compression

Model Code continued on next page.

Code Description[1]	Code Option	Option Description[1]
VI. Mechanical Connection (cont.) (Body size 3 unless noted Size 4 only. Size 4 noted)	3A	DIN DN15 PN40 Flange
	3B	DIN DN25 PN40 Flange
	3C	DIN DN40 PN40 Flange
	3D	DIN DN15 PN40 Flange
	3E	ANSI 1/2" 150# RF Flange
	3F	ANSI 1/2" 300# RF Flange
	3G	ANSI 1" 150# RF Flange
	3H	ANSI 1" 300# RF Flange
	3J	ANSI 1-1/2" 150# RF Flange (Size 3 & 4)
	3K	ANSI 1-1/2" 300# RF Flange
	3L	ANSI 2" 150# RF Flange (Size 4 only)
	3N	ANSI 3" 150# RF Flange (Size 4 only)
	3P	ANSI 3-1/2" 300# RF Flange (Size 4 only)
	3Q	ANSI 3" 600# RF Flange (Size 4 only)
	3R	DIN DN80 PN40 Flange (Size 4 only)
	3S	DIN DN80 PN64 Flange (Size 4 only)
	3T	DIN DN80 PN100 Flange (Size 4 only)
	4A	ANSI 4" 150# RF Flange (Size 4 only)
	4B	ANSI 4" 300# RF Flange (Size 4 only)
	4C	ANSI 4" 600# RF Flange (Size 4 only)
	4D	DIN DN100 PN16 Flange (Size 4 only)
	4E	DIN DN100 PN40 Flange (Size 4 only)
	4F	DIN DN100 PN64 Flange (Size 4 only)
	5C[2]	1 1/16-12 X 1/2" Sanitary
	5D[2]	1 1/16-12 X 3/4" Sanitary
	5E[2]	1 1/16-12 X 1" Sanitary
	6A	ANSI 6" 150# RF Flange (Size 4 only)
	6B	ANSI 6" 300# RF Flange (Size 4 only)
	6C	ANSI 6" 600# RF Flange (Size 4 only)
	6D	DIN DN150 PN16 Flange (Size 4 only)
	6E	DIN DN150 PN40 Flange (Size 4 only)
	6F	DIN DN150 PN64 Flange (Size 4 only)
	8A	ANSI 8" 150# RF Flange (Size 4 only)
	8B	ANSI 8" 300# RF Flange (Size 4 only)
	8C	DIN DN200 PN10 Flange (Size 4 only)
	8D	DIN DN200 PN16 Flange (Size 4 only)
	8E	DIN DN200 PN25 Flange (Size 4 only)
	8F	DIN DN200 PN64 Flange (Size 4 only)
VII. O-ring Material	A	Viton
	B	Buna
	C	PTFE
	D	Kalrez
	E	EPDM (Not available in Size 4)
	J	FDA/USP Class VI - Viton (Not available in Size 4)
	L	FDA/USP Class VI - EPDM (Not available in Size 4)
VIII. Valve Seat	A	None (Sensor only)
	B	Viton (for body size 3, diaphragm material = PTFE)
	C	Buna (for body size 3, diaphragm material = PTFE)
	D	Kalrez (for body size 3, diaphragm material = PTFE)
	E	EPDM (for body size 3, diaphragm material = PTFE) (Not available in Size 4)
	F	PTFE

Request a Quote

Code	Description[1]	Code Option	Option Description[1]		
IX.	Valve Type	0	None (Sensor only)		
		1	Normally closed		
		2	Normally closed (Pressure diff. >30 psig (2 bar))		
		3	Normally closed (Pressure diff.<30 psig (2 bar))		
		4	Normally closed - high pressure		
		5	Normally open		
X.	Analog I/O Communications	A	None - Digital Communications only		
		E	4-20 mA	0-5 Volt	PG11 Cable Gland
		F	0-5 Volt	0-5 Volt	PG11 Cable Gland
		G	4-20 mA	4-20 mA	PG11 Cable Gland
		H	0-5 Volt	4-20 mA	PG11 Cable Gland
		I	0-5 Volt	0-20 mA	PG11 Cable Gland
		J	0-5 Volt	0-5 Volt	1/2" NPT (F) Conduit
		K	4-20 mA	4-20 mA	1/2" NPT (F) Conduit
		N	0-5 Volt	4-20 mA	M20x1.5 Conduit
		O	0-5 Volt	0-20 mA	M20x1.5 Conduit
		P	4-20 mA	0-5 Volt	M20x1.5 Conduit
		Q	0-20 mA	0-5 Volt	M20x1.5 Conduit
X.	Analog I/O Communications (cont.)	R	1-5 Volt	1-5 Volt	PG11 Cable Gland
		S	0-20 mA	0-20 mA	PG11 Cable Gland
		T	1-5 Volt	1-5 Volt	1/2" NPT (F) Conduit
		U	0-20 mA	0-20 mA	1/2" NPT (F) Conduit
		V	0-5 Volt	0-5 Volt	M20x1.5 Conduit
		W	1-5 Volt	1-5 Volt	M20x1.5 Conduit
		X	0-20 mA	0-20 mA	M20x1.5 Conduit
		Y	4-20 mA	4-20 mA	M20x1.5 Conduit
		Z	0-20 mA	0-5 Volt	PG11 Cable Gland
		5	0-5 Volt	4-20 mA	1/2" NPT (F) Conduit
		6	0-5 Volt	0-20 mA	1/2" NPT (F) Conduit
		7	4-20 mA	0-5 Volt	1/2" NPT (F) Conduit
		8	0-20 mA	0-5 Volt	1/2" NPT (F) Conduit
XI.	Power Supply Inputs	1	±15 Vdc		
		2	24 Vdc		
XII.	Output Enhancements	A	Standard response		
XIII.	Certification	1	Safe Area		
		2	For Zone 2 Atex		
		3	Div. 2 / Zone 2 UL Listed		
		4	Div. 2 / Zone 2 UL Recognized		
		5	Zone 2 IECEx		
		6	KOSHA		

Sample Standard Model Code

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
SLA	MF	4	0	S	1A	A	B	1	E	1	A	1

1 See Page 5 for *Biotech* Model Code Options
2 Sanitary Fittings Model Code 5A, 5B, 5C, 5D and 5E are limited to 500 PSI Maximum Pressure

Request a Quote

Brooks is committed to assuring all of our customers receive the ideal flow solution for their application, along with outstanding service and support to back it up. We operate first class repair facilities located around the world to provide rapid response and support. Each location utilizes primary standard calibration equipment to ensure accuracy and reliability for repairs and recalibration and is certified by our local Weights and Measures Authorities and traceable to the relevant International Standards.

Visit www.BrooksInstrument.com to locate the service location nearest to you.

START-UP SERVICE AND IN-SITU CALIBRATION

Brooks Instrument can provide start-up service prior to operation when required. For some process applications, where ISO-9001 Quality Certification is important, it is mandatory to verify and/or (re)calibrate the products periodically. In many cases this service can be provided under in-situ conditions, and the results will be traceable to the relevant international quality standards.

CUSTOMER SEMINARS AND TRAINING

Brooks Instrument can provide customer seminars and dedicated training to engineers, end users, and maintenance persons. Please contact your nearest sales representative for more details. Due to Brooks Instrument's commitment to continuous improvement of our products, all specifications are subject to change without notice.

DS-TMF-SLAMf Series-RevB-MFC-eng/2019-11

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