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Model SLAMF50
with EtherNet/IP™

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, explosive gas environments, and/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 and hazardous area enclosure protects our advanced digital electronics and ensures stable, accurate measurement and control of your process-critical gas 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
Hazardous area & IP66 certifications available	Ensures process accuracy and control in explosive and harsh conditions
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

Product Description

Superior Thermal Flow Measurement Sensor

Brooks Instrument 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.

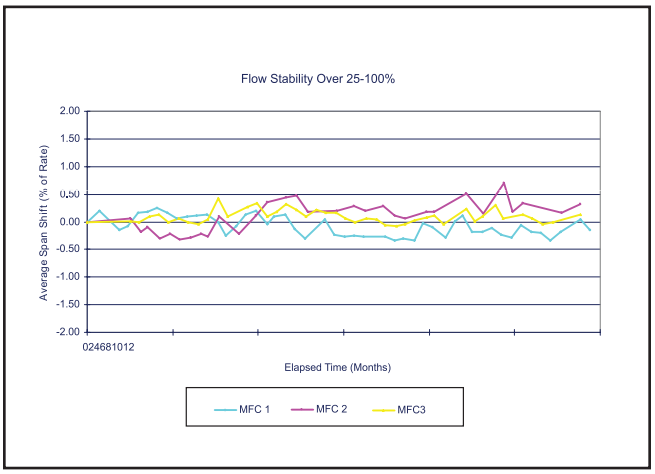
Hazardous Area & IP66 Rating

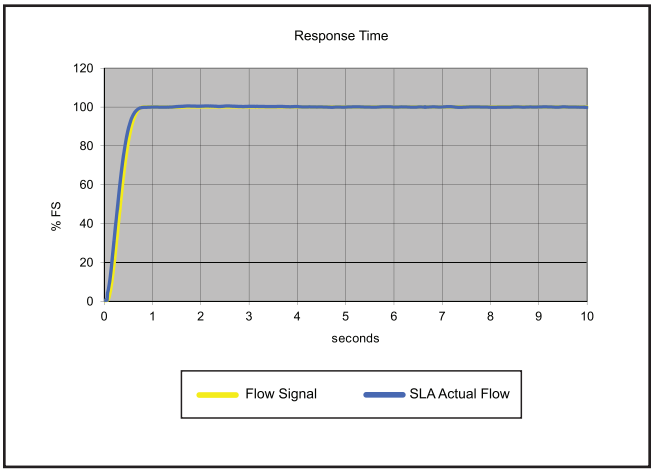
The SLAMf Series provides the highest rated enclosure for electrical protection against explosive gas and harsh envrionments. It is available with UL listed/ATEX Hazardous ratings, and IP66 Ingress Protection (equivalent to NEMA4X). These are used to define levels of sealing effectiveness of electrical enclosures against explosive gases, intrusion from foreign bodies (tools, dirt etc.) and moisture.

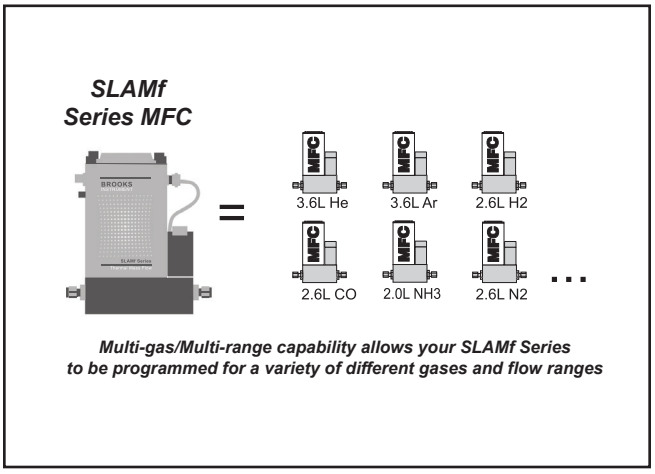
- Class I/Zone 2/Div 2: Available Certified Protection for devices installed directly in the (occasional) presence of hazardous gases or vapors
- IP66 Enclosure: IP rated as "dust tight" and protected against heavy seas or powerful jets of water.
- NEMA4X is intended mainly for outdoor use where extra 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.

Product Specifications

SLAMf Series Standard

Mass Flow Controller Model	Mass Flow Meter Model	Flow Ranges N_2 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 slpm	1500 psi/103 bar	4500 psi/310 bar	SEP
SLAMf51	SLAMf61	15	150 slpm[2]	1500 psi/103 bar[3]	NA[4]	SEP
SLAMf53	SLAMf63	100	2500 slpm	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[5] 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
[5] Pressure per body size as noted or maximum pressure of the selected flange; see Instruction and Operations Manual

	SLAMf50/60	SLAMf51/61	SLAMf53/63		SLAMf64
PERFORMANCE					
Full Scale Flow Range (N2, Eq. 0 Deg C Ref)	0.003 - 50 slpm	15 - 150 slpm	100 - 1100 slpm	1100 - 2500 slpm	18– 2160 m^3/hr
Flow Accuracy—17025 Certified Devices (Includes linearity, excludes calibration system measurement uncertainty per SEMI E69)[6]	±0.6% of S.P. (20-100% FS), ±0.12% FS (<20% FS)			±0.6% of FS	N/A
Flow Accuracy (Includes linearity and calibration system measurement uncertainty per SEMI E69)[6]	±0.9% of S.P. (20-100% FS), ±0.18% of F.S. (<20% FS)			±1.0% of FS	±1.0% of FS
Control Range N2, eq.	100:1 for FS from 1-50 slpm (50:1 for all other FS flows)				N/A
Repeatability & Reproducibility	0.20% S.P				±0.25% SP
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% FS per year				
Temperature Coefficient	Zero: <0.05% of FS per °C Span: < 0.1% of SP per °C				
Attitude Sensitivity	<0.2% FS maximum deviation from specified accuracy after re-zeroing				
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.: 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		N/A
Maximum Pressure Differential (Controllers)	Application specific up to 1500 psi/103.4 bar[8]	290 psi/20.0 bar			N/A
Leak Integrity (external)	$1x10^{-9}$ atm. cc/sec He				
Valve Shut Down (leak by)[9] [10]	<1% of FS				N/A
MECHANICAL					
Valve Type	Normally Closed, Normally Open, Meter				N/A
Primary Wetted Materials	316, 316/316L Stainless Steel, High Alloy, Stainless Steel, Viton® fluoroelastomers, Buna-N, Kalrez®, Teflon®/ Kalrez®, and EPDM				
DIAGNOSTICS					
Status Lights	MFC Health, Network Status				
Alarms[11]	Control Valve Output, Flow Totalizer, Network Interruption, Over Temperature, Power Surge/Sag, Service Required				
Diagnostic/Service Port	RS485 via 2.5mm jack				

[6] Accuracy at calibration conditions ; accuracy spec valid across the full control range
[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
[11] Alarm modes are dependent on the communications interface. These are described in the corresponding digital communication interface manual

Product Specifications

	RS485	Profibus	DeviceNet™	EtherNet/IP™ & PROFINET
Communication Protocol				
Electrical Connection	Terminal Block Connections via 1/2" NPT (F) Conduit Optional: PG11 Cable Gland or M20 x 1.5 Conduit			1x 4-pin M12 Male 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": 8W Valve Orifice ≤ 0.032": 5W Without Valve: 2W		Valve Orifice > 0.032": 10W Valve Orifice ≤ 0.032": 7W Without Valve: 4W	Valve Orifice > 0.032": 11W Valve Orifice ≤ 0.032": 7W Without Valve: 3W
Embedded Browser Interface	N/A		N/A	The Default Network Address is 192.168.1.100. EtherNet/IP: Default Network Configuration is DHCP PROFINET: The Default Name is "brooks-sla"

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	FDA/USP Class VI and ADI Free O-Rings and Valve Seats[13] (Certificate Included)
Certifications	Materials of Construction (wetted path) 2.1 Material Cert[14] 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] All Class VI Viton elastomers are also compliant to 21CFR177.2600 (Title 21 – Food & Drugs, Chapter I - FDA)

[14] 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

	SLAMf50/60	SLAMf51/61	SLAMf53/63	
Performance				
Full Scale Flow Ran (N_2, Eq. 0 Deg C Ref)	5 sccm - 50 slpm	15 - 150 slpm[1]	100 - 1100 slpm	>1100 - 2500 slpm
Gasses Supported[2]	Air, CO_2, Nitrogen & Oxygen			
Flow Accuracy (includes linearity and calibration system measurement uncertainty per SEMI E69)[3]	±0.9% of SP (20-100% FS), ±0.18% of FS (< 20% FS)			±1.0% of FS
Repeatability & Reproducibility	0.20% S.P.			
Turndown (control range)	250:1	250:1	150:1	
Response Time	< 1 Second	< 1 Second	< 3 Second	
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 CO2 available as an option on SLAMf50/60 & SLAMf51/61
[3] Accuracy at Calibration Conditions; accuracy spec valid across the full control range

	SLAMf50/60	SLAMf51/61	SLAMf53/63
Ratings			
Inlet Pressure Range	5 psig to 75 psig	10 psig to 75 psig	8 psig to 75 psig
Minimum Pressure Differential (Controllers)[4]	5 psi/0.35 ba	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)[5]	30 psi/ 2 bar	30 psi/ 2 bar	30 psi/ 2 bar
Maximum Pressure	Same as standard		
Valve Configuration	Standard SLA with Special Factory Tuning/Normally Closed		
Operating Temperature Range	-14˚C - 50˚C		
Sensor Design	Enhanced construction to meet industry standards for cleanliness		

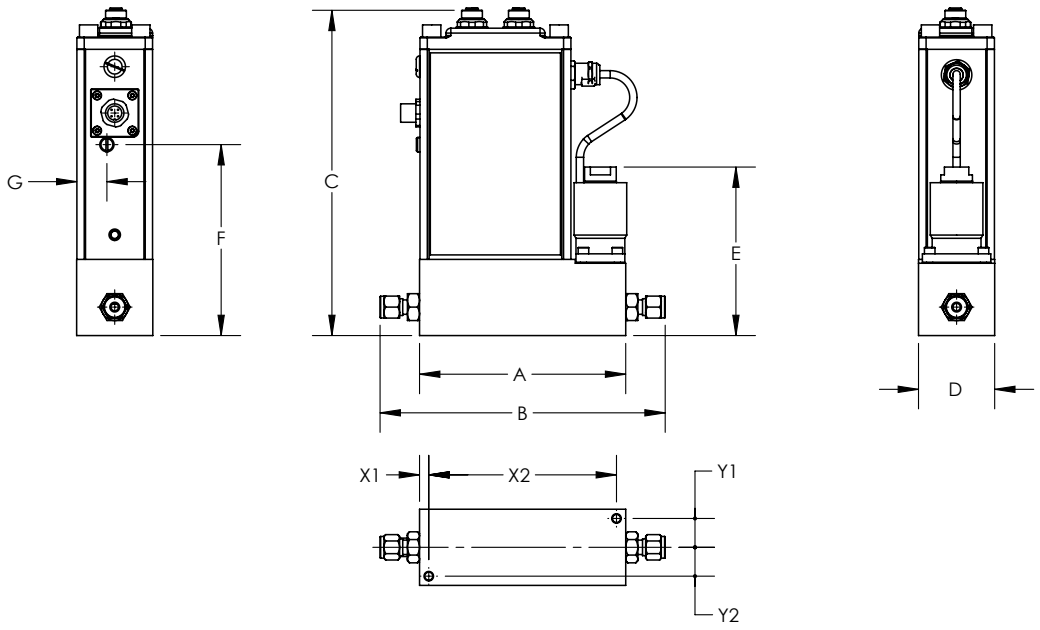
[4] Performance at minimum inlet pressure will be gas and flow range dependent. Consult Applications Engineering for details
[5] For optimum performance operate at the specified inlet and outlet pressure values

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 SLAMf53 or SLAMf63

Learn More About the SLAMf Series *Biotech*

SLAMf40/50/51/60/61



FITTINGS - DIMENSION "B"				
FITTING	50	51**	60	61**
	mm / inch	mm / inch	mm / inch	mm / inch
9/16"-18 UNF	N/A	148.5 / 5.85	N/A	113.2 / 4.46
1/8" TUBE COMP. *	180.7 / 7.12	N/A	145.3 / 5.72	N/A
1/4" TUBE COMP.*	185.3 / 7.30	199.8 / 7.87	149.9 / 5.90	164.5 / 6.48
3/8" TUBE COMP.*	188.4 / 7.42	202.9 / 7.99	152.9 / 6.02	167.6 / 6.60
1/2" TUBE COMP.*	192.4 / 7.58	206.9 / 8.15	157.0 / 6.18	171.6 / 6.76
1/4" VCO	173.6 / 6.84	188.1 / 7.41	138.2 / 5.44	152.9 / 6.02
3/8"-1/2" VCO	184.8 / 7.28	199.3 / 7.85	149.4 / 5.88	164.1 / 6.46
1/4" NPT-F	176.2 / 6.94	190.7 / 7.51	140.7 / 5.54	153.4 / 6.04
6mm TUBE COMP.*	185.4 / 7.30	199.9 / 7.87	149.9 / 5.90	164.6 / 6.48
10mm TUBE COMP.*	188.8 / 7.43	203.3 / 8.00	153.2 / 6.03	167.9 / 6.61
1/4" VCR	181.8 / 7.16	196.3 / 7.73	146.3 / 5.76	161.0 / 6.34
3/8"-1/2" VCR	189.4 / 7.46	203.9 / 8.03	153.9 / 6.06	168.7 / 6.64
1/4" RC (BSP)	174.2 / 6.86	188.7 / 7.43	138.8 / 5.46	153.4 / 6.04
1/2" SANITARY	198.1 / 7.80	212.6 / 8.37	162.6 / 6.40	177.3 / 6.98
3/4" SANITARY	198.1 / 7.80	212.6 / 8.37	162.6 / 6.40	177.3 / 6.98

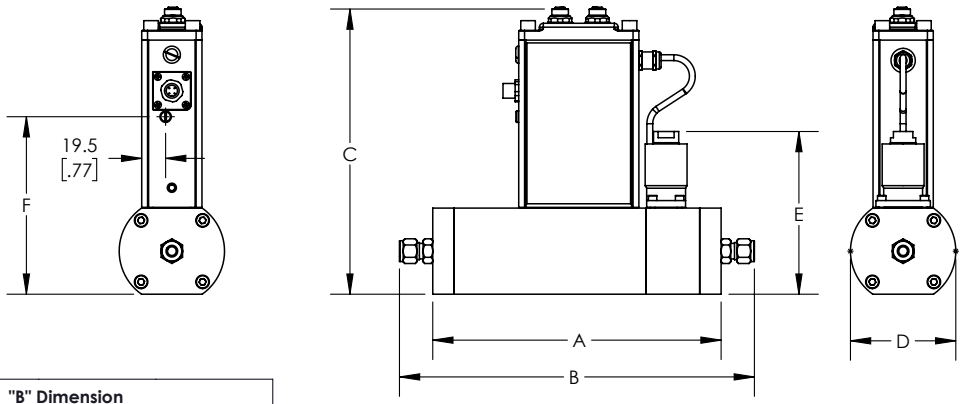
MOUNTING HOLES				
Model	X1	X2	Y1	Y2
	mm / inch	mm / inch	mm / inch	mm / inch
50	6.0 / .24	122.0 / 4.80	18.8 / .74	18.8 / .74
51	22.4 / .88	120.1 / 4.73	18.8 / .74	18.8 / .74
60	6.0 / .24	86.7 / 3.41	18.75 / .74	18.75 / .74
61	22.4 / .88	84.7 / 3.33	18.75 / .74	18.75 / .74

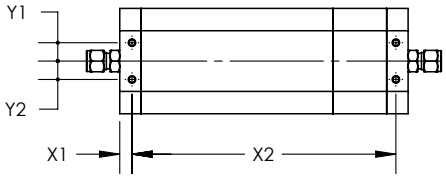
*OVERAL LENGTH FINGER TIGHT
**DEVICES WITH 5848 INLET FILTER WILL BE 1.41" LONGER

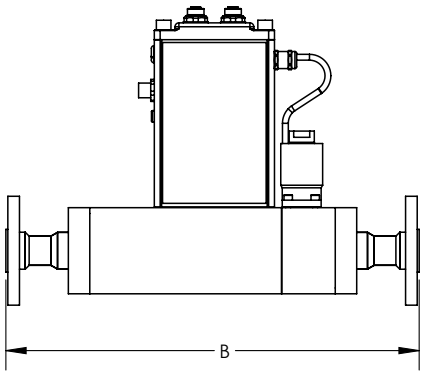
ELECTRO/MECHANICAL DIMENSIONS													
Model	A	C					E			F	D	G	
		Analog RS485	Profibus	DeviceNet	EtherCat	ProfiNet/ EtherNet	N.C	N.O.	NO VALVE				
	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch	
50	134.0 / 5.28	200.0 / 7.87	216.2 / 8.51	200.0 / 7.87	210.9 / 8.30	211.4 / 8.32	109.5 / 4.31	N/A	57.3 / 2.26	124.1 / 4.89	49.5 / 1.95	19.5 / .77	
51	148.5 / 5.85	200.0 / 7.87	216.2 / 8.51	200.0 / 7.87	210.9 / 8.30	211.4 / 8.32	109.5 / 4.31	N/A	57.3 / 2.26	124.1 / 4.89	49.5 / 1.95	19.5 / .77	
60	98.6 / 3.88	200.0 / 7.87	216.2 / 8.51	200.0 / 7.87	210.9 / 8.30	211.4 / 8.32	N/A	N/A	N/A	124.1 / 4.89	49.5 / 1.95	19.5 / .77	
61	113.2 / 4.46	200.0 / 7.87	216.2 / 8.51	200.0 / 7.87	210.9 / 8.30	211.4 / 8.32	N/A	N/A	N/A	124.1 / 4.89	49.5 / 1.95	19.5 / .77	

Access our library of CAD Drawings

SLAMf53/63







"B" Dimension		
FITTING	MF53	MF63
	mm / inch	mm / inch
9/16"-18 UNF	235.4 / 9.27	191.6 / 7.54
1-1/16" - 12 UN	235.4 / 9.27	191.6 / 7.54
1-5/16" - 12UN	235.4 / 9.27	191.6 / 7.54
3/8" TUBE COMP.*	290.0 / 11.41	245.8 / 9.68
1/2" TUBE COMP.*	303.5 / 11.95	259.6 / 10.22
3/4" TUBE COMP.*	303.5 / 11.95	259.6 / 10.22
1" TUBE COMP.*	312.2 / 12.29	268.2 / 10.56
3/8"-1/2" VCO	286.3 / 11.27	242.3 / 9.54
3/4" VCO	293.4 / 11.55	249.4 / 9.82
1" VCO	296.4 / 11.67	252.5 / 9.94
1/2" NPT	235.4 / 9.27	191.6 / 7.54
1" NPT	235.4 / 9.27	191.6 / 7.54
1-1/2" NPT	235.4 / 9.27	191.6 / 7.54
12mm TUBE COMP.*	299.5 / 11.79	255.5 / 10.06
3/8"-1/2" VCR	294.4 / 11.59	250.4 / 9.86
3/4" VCR	316.7 / 12.47	272.8 / 10.74
1" VCR	321.3 / 12.65	277.4 / 10.92
1/2" RC (BSP)	235.4 / 9.27	191.6 / 7.54
1" RC (BSP)	235.4 / 9.27	191.6 / 7.54
1/2" SANITARY	300.0 / 11.81	256.0 / 10.08
3/4" SANITARY	300.0 / 11.81	256.0 / 10.08
1" SANITARY	300.0 / 11.81	256.0 / 10.08
ANSI 1/2" 150#	337.4 / 13.28	293.6 / 11.56
ANSI 1/2" 300#	337.4 / 13.28	293.6 / 11.56
ANSI 1" 150#	337.4 / 13.28	293.6 / 11.56
ANSI 1" 300#	337.4 / 13.28	293.6 / 11.56
ANSI 1.5" 150#	337.4 / 13.28	293.6 / 11.56
ANSI 1.5" 300#	337.4 / 13.28	293.6 / 11.56
ANSI 2" 150#	337.4 / 13.28	293.6 / 11.56
ANSI 2" 300#	337.4 / 13.28	293.6 / 11.56
DIN DN15 PN40	337.4 / 13.28	293.6 / 11.56
DIN DN25 PN40	337.4 / 13.28	293.6 / 11.56
DIN DN40 PN40	337.4 / 13.28	293.6 / 11.56

*OVERAL LENGTH FINGER TIGHT

MOUNTING HOLES				
Model	X1	X2	Y1	Y2
	mm / inch	mm / inch	mm / inch	mm / inch
MF53	10.0 / .39	215.4 / 8.48	15.0 / .59	15.0 / .59
MF63	10.0 / .39	171.6 / 6.76	15.0 / .59	15.0 / .59

ELECTRO/MECHANICAL DIMENSIONS									
Model	A	C					D	E	F
		Analog RS485	Profibus	DeviceNet	EtherCat	ProfiNet/ EtherNet			
	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch
MF53	235.4 / 9.27	220.8 / 8.69	237.0 / 9.33	220.8 / 8.69	220.8 / 8.69	232.2 / 9.14	86.0 / 3.39	132.8 / 5.23	144.9 / 5.70
MF63	191.6 / 7.54	220.8 / 8.69	237.0 / 9.33	220.8 / 8.69	220.8 / 8.69	232.2 / 9.14	86.0 / 3.39	N/A	144.9 / 5.70

Access our library of CAD Drawings

Model Code

Code Description	Code Option	Option Description
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	15 - 150 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	3mm tube compression w/Filter
	5A[1]	9/16-18 X 1/2" Sanitary
	5B[2]	9/16 -48 X 3/4" Sanitary
VI. Mechanical Connection (Body size 3 unless noted otherwise)	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

Code Description	Code Option	Option Description
VI. Mechanical Connection (cont.) (Body size 3 unless noted otherwise)	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
	3M	ANSI 2" 300# RF Flange
	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[1]	1 1/16-12 X 1/2" Sanitary
	5D[1]	1 1/16-12 X 3/4" Sanitary
	5E[1]	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 and ADI Free - Viton/FKM² (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
	G	Metal (for body Size 3, diaphragm material = PTFE)
	J	FDA/USP Class VI and ADI Free - Viton/FKM² (Not available in Size 4)

Code Description	Code Option	Option Description		
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
	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	PG11 Cable Gland
	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. Power Supply Inputs	A	Standard response		
	S	Biotech Performance Package		
	T	Biotech Premium Package		
	U[3]	Performance Package with CO Calibration		
	V[3]	Premium Package with CO Calibration		
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		

[1] Sanitary Fittings Model Code 5A, 5B, 5C, 5D and 5E are limited to 500 PSI Maximum Pressure
[2] Material is compliant to 21CFR177.2600 (Title 21 – Food & Drugs, Chapter I - FDA)
[3] CO_2 Actual Gas Calibration available for SLA5850/60 & SLA5851/61

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

Request a Quote

Approvals, Certifications and Services

Product Approvals Overview

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 ec IIC T4 Gc II 3 D Ex tc IIIC T 85 °C Dc IP66	EN IEC 60079-0: 2018 EN 60079-7: 2015+ A1:2018 EN 60079-31: 2014	KEMA 04ATEX1290 X
	IECEx	Ex ec IIC T4 Gc Ex tc IIIC T 85 °C Dc IP66	IEC 60079-0: 2017 (Ed. 7) IEC 60079-7:2015 (Ed. 5.1) IEC 60079-31: 2013 (Ed. 2)	IECEx KEM 08.0043X
	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

ATEX/IECEx Special Conditions: Please see Certification section of the SLAMf Series Installation & Operations Manual

Note: Not all certifications are available for all SLAMF specifications and configurations.

Additional Certification and Service Options

Material Compliance Certifications
Material Certificate 2.1
Material Certificate 3.1
Declaration of Compliance 2.1 - O-ring USP Class VI / ADI Free
Declaration of Compliance 2.1 - Elastomer USP Class VI / ADI Free
Declaration of Compliance 2.1 - Elastomer Cure Date/ Shelf Life
Declaration of Compliance 2.1 - Surface Roughness
Metrology Certifications
Declaration of Compliance 2.1 - Calibration
Inspection Certificate 3.1 - NIST Calibration
Declaration of Compliance 3.1 - International Certificate of Calibration
ISO 17025 Certification
Additional Services and Certifications
Certificate of Compliance 2.1
Declaration of Compliance 2.1 - Oxygen Cleaning Service
Declaration of Compliance 2.2 - Pressure Test
KHK Certification
CRN Certification
Certificate of Origin

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

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Global Headquarters
Brooks Instrument
407 West Vine Street
Hatfield, PA
19440-0903 USA

Toll-Free (USA): 888-554-FLOW
T: 215-362-3500
BrooksAM@BrooksInstrument.com

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

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