

# 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, or washdown requirements, SLAMF Series thermal mass flow controllers and meters deliver the precise accuracy and long-term stability of our proven SLA family of meters and controllers. An IP66 and hazardous area enclosure protects our advanced digital electronics and ensures stable, accurate measurement and control of your process-critical gas mass flows. A broad range of analog and digital I/O options ensures SLAMF Series is well-suited for chemical and petrochemical research, laboratory, analytical, fuel cell, biotechnology, and life science applications, among others.



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	Primary calibration backed by 17025 metrology systems ensures precise process gas flow control
Simple Modular Architecture	The highly configurable platform offers a carefully selected set of features enabling drop-in replacement and upgrade of many brands of mass flow controllers
Wide Range of Available Options	Provides users with a single platform to support various applications

# Product Specifications

## SLAMF Series Standard

Mass Flow Controller Model	Mass Flow Meter Model	Flow Ranges N <sub>2</sub> Eq. Ratings		Maximum Operating Pressure psi/bar		PED Module H Category
		Min. F.S.	Max. F.S.	Standard <sup>1</sup>	Optional <sup>1</sup>	
SLAMF50	SLAMF60	0.003 slpm	50 slpm	1500 psi / 103 bar	4500 psi / 310 bar Maximum Flow of 10 lpm (meter) or 50 lpm (controller)	SEP
SLAMF51	SLAMF61	15 slpm	150 slpm <sup>2</sup>	1500 psi / 103 bar <sup>3</sup>	N/A <sup>4</sup>	SEP
SLAMF53	SLAMF63	100 slpm	2500 slpm	1000 psi / 69 bar	N/A	1 for all 150lb flanges 2 for all other connections
---	SLAMF64	60 m <sup>3</sup> /h	540 m <sup>3</sup> /h	Flow rate dependant		2" & 3" - 85 bar 4" - 70 bar

<sup>1</sup> Sanitary fittings - Model code 5A, 5B, 5C, 5D & 5E rated to 500 psi Maximum Pressure.

<sup>2</sup> 600 lpm of H<sub>2</sub> possible with decreased accuracy. Greater than 40 psig inlet required for flows greater than 100 lpm N<sub>2</sub> equivalent.

<sup>3</sup> 1000 psi / 70 bar for UL Certificate.

<sup>4</sup> 3000 psi / 206 bar available as a special on SLAMF61 only. Increased footprint, consult Applications Engineering for details.

	SLAMF50/60	SLAMF51/61	SLAMF53/63	SLAMF64
<b>Performance</b>				
<b>Full Scale Flow Range (N<sub>2</sub>, Eq. 0°C Ref)</b>	0.003 - 50 slpm	15 - 150 slpm	100 - 1100 slpm	1100 - 2500 slpm
<b>Flow Accuracy—17025 Certified Devices</b> (Includes linearity, excludes calibration system measurement uncertainty per SEMI E69) <sup>5</sup>	±0.6% of S.P. (20 - 100% F.S.), ±0.12% F.S. (<20% F.S.)		±0.6% of F.S.	±0.6% of F.S.
<b>Flow Accuracy</b> (Includes linearity and calibration system measurement uncertainty per SEMI E69) <sup>5</sup>	±0.9% of S.P. (20 - 100% F.S.), ±0.18% of F.S. (<20% F.S.)		±1.0% of F.S.	±1.0% of F.S.
<b>Control Range N<sub>2</sub>, eq.</b>	100:1 for F.S. from 1 - 50 slpm (50:1 for all other F.S. flows)			N/A
<b>Repeatability &amp; Reproducibility</b>	0.20% S.P			±0.25% S.P.
<b>Linearity</b>	Included in accuracy			
<b>Response Time (Settling Time within ±2% F.S. for 0 - 100% command step)</b>	<1 second		<3 seconds	N/A
<b>Zero Stability</b>	<±0.2% F.S. per year			
<b>Temperature Coefficient</b>	Zero: <0.05% of F.S. per °C Span: <0.1% of S.P. per °C			
<b>Attitude Sensitivity</b>	<0.2% F.S. maximum deviation from specified accuracy after re-zeroing			

<b>Ratings</b>				
<b>Operating Temperature Range</b>	(-14) - 65°C (7 - 149°F) <sup>6</sup>			
<b>Minimum Pressure Differential (Controllers)</b>	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
<b>Maximum Pressure Differential (Controllers)</b>	Application specific up to 1500 psi / 103 bar <sup>7</sup>	Application specific up to 1500 psi / 103 bar	Application specific up to 290 psi / 20 bar	N/A
<b>Leak Integrity (External)</b>	1x10 <sup>-9</sup> atm. cc/sec He			
<b>Valve Shut Down (Leak-by)<sup>8,9</sup></b>	<1% of F.S. standard; improved shut off available with Biotech package			N/A

<b>Mechanical</b>				
<b>Valve Type</b>	Normally Closed, Normally Open, Meter			
<b>Wetted Materials</b>	316, 316/316L Stainless Steel, High Alloy, Stainless Steel, Viton® fluoroelastomers, Buna-N, Kalrez®, Teflon®/ Kalrez®, and EPDM			

<b>Diagnostics</b>				
<b>Status Lights</b>	MFC Health, Network Status			
<b>Alarms<sup>10</sup></b>	Communications protocol dependent. Full set available on EtherNet/IP and PROFINET. See communications manuals for list.			
<b>Diagnostic/Service Port</b>	RS485 via 2.5mm jack			

<sup>5</sup> Accuracy at calibration conditions; accuracy spec valid across the full control range.

<sup>6</sup> Hazardous area certifications have a temperature range limitation of 0 - 65°C.

<sup>7</sup> >1500 PSI DP as a Special Order.

<sup>8</sup> Metal and Teflon Seats are <5% of F.S.

<sup>9</sup> Leak-by and valve shutdown specs for normally closed valve type.

<sup>10</sup> 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
<b>Communication Protocol</b>				
<b>Electrical Connection</b>	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
<b>Analog I/O</b>	0 - 5 V, 1 - 5 V, 0 - 10 V, 0 - 20 mA, 4 - 20 mA	N/A		N/A
<b>Power Max. / Purge</b>	From +13.5 Vdc to +27 Vdc	From +11 Vdc to +25 Vdc	From +13.5 Vdc to +27 Vdc	
<b>Power Requirements Watts, Max.</b>	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	
<b>Embedded Browser Interface</b>	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"
<b>Flow Input (Voltage) Specifications</b>				
<b>Nominal Range</b>	0 - 5 Vdc, 1 - 5 Vdc or 0 - 10 Vdc			
<b>Full Range</b>	(-0.5) - 11 Vdc			
<b>Absolute Max</b>	18 V (without damage)			
<b>Input Impedance</b>	>990 kOhms			
<b>Required Max. Sink Current</b>	0.002 mA			
<b>Flow Input (Current) Specifications</b>				
<b>Nominal Range</b>	4 - 20 mA or 0 - 20 mA			
<b>Full Range</b>	0 - 22 mA			
<b>Absolute Max</b>	24 mA (without damage)			
<b>Input Impedance</b>	100 Ohms			
<b>Flow Output (Voltage) Specifications</b>				
<b>Nominal Range</b>	0 - 5 Vdc, 1 - 5 Vdc or 0 - 10 Vdc			
<b>Full Range</b>	(-1) - 11 Vdc			
<b>Min Load Resistance</b>	2 kOhms			
<b>Flow Output (Current) Specifications</b>				
<b>Nominal Range</b>	0 - 20 mA or 4 - 20 mA			
<b>Full Range</b>	0 - 22 mA (@ 0 - 20 mA); 3.8 - 22 mA (@ 4 - 20 mA)			
<b>Max. Load</b>	380 Ohms (for supply voltage: <16 Vdc)			
<b>Analog I/O Alarm Output<sup>11</sup></b>				
<b>Type</b>	Open Collector			
<b>Max. Closed (On) Current</b>	25 mA			
<b>Max. Open (Off) Leakage</b>	1µA			
<b>Max. Open (Off) Voltage</b>	30 Vdc			
<b>Analog I/O Valve Override Signal Specifications<sup>12</sup></b>				
<b>Floating / Unconnected</b>	Instrument controls valve to command set point			
<b>VOR &lt; 0.3 Vdc</b>	Valve Closed			
<b>1 Vdc &lt; VOR &lt; 4 Vdc</b>	Valve Normal			
<b>VOR &gt; 4.8 Vdc</b>	Valve Open			
<b>Input Impedance</b>	800 kOhms			
<b>Absolute Max. Input</b>	(-25 Vdc) < VOR < 25 Vdc (without damage)			

<sup>11</sup> 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.

<sup>12</sup> 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

### Options Packages

#### Performance Package - Model Code S or U (Position XII)

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 <sup>13</sup>	Air, CO <sub>2</sub> , N <sub>2</sub> & O <sub>2</sub> : gas pages can be changed in situ to reduce the variety of spare instruments kept in stock

#### Premium Package - Model Code T or V (Position XII)

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 <sup>14</sup> (Certificate Included)
Certifications	Materials of Construction (wetted path) 2.1 Material Cert <sup>15</sup> ICC Calibration Traceability

<sup>13</sup> CO<sub>2</sub> Actual Gas Calibration available for SLAMF50/60 & SLAMF51/61. Use Model Code U for Performance Package, and Model Code V for Premium package.

<sup>14</sup> All Class VI Viton elastomers are also compliant to 21CFR177.2600 (Title 21 – Food & Drugs, Chapter I - FDA).

<sup>15</sup> 3.1 Material Certs for pressure boundary components available as an option on Premium Package.

	SLAMF50/60	SLAMF51/61	SLAMF53/63	
<b>Performance</b>				
<b>Full Scale Flow Range</b> (N <sub>2</sub> , Eq. 0°C Ref)	5 sccm - 50 slpm	15 - 150 slpm <sup>16</sup>	100 - 1100 slpm	>1100 - 2500 slpm
<b>Gasses Supported<sup>17</sup></b>	Air, CO <sub>2</sub> , Nitrogen & Oxygen			
<b>Flow Accuracy—17025 Certified Devices</b> (includes linearity, excludes calibration system measurement uncertainty per SEMI E69)	±0.6% of S.P. (20 - 100% F.S.), ±0.12% of F.S. (<20% F.S.)			±0.6% of F.S.
<b>Flow Accuracy</b> (includes linearity and calibration system measurement uncertainty per SEMI E69) <sup>18</sup>	±0.9% of S.P. (20 - 100% F.S.), ±0.18% of F.S. (<20% F.S.)			±1.0% of F.S.
<b>Repeatability &amp; Reproducibility</b>	0.20% S.P.			
<b>Turndown</b> (Control Range)	250:1	250:1	150:1	
<b>Response Time</b>	<1 Second	<1 Second	<3 Second	
<b>Valve Shut Down (Leak-by)</b>	<0.005 sccm			<15.6 sccm

### Ratings

<b>Inlet Pressure Range</b>	5 psig - 75 psig	10 psig - 75 psig	8 psig - 75 psig
<b>Minimum Pressure Differential</b> (Controllers) <sup>19</sup>	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
<b>Maximum Pressure Differential</b> (Controllers) <sup>20</sup>	75 psi / 5 bar		
<b>Maximum Pressure</b>	Same as standard		
<b>Valve Configuration</b>	Standard SLA with Special Factory Tuning / Normally Closed		
<b>Operating Temperature Range</b>	-14°C - 50°C		
<b>Sensor Design</b>	Enhanced construction to meet industry standards for cleanliness		

<sup>16</sup> Maximum flow depends on pressure conditions; consult Applications Engineering for details.

<sup>17</sup> Calibration on CO<sub>2</sub> available as an option on SLAMF50/60 & SLAMF51/61.

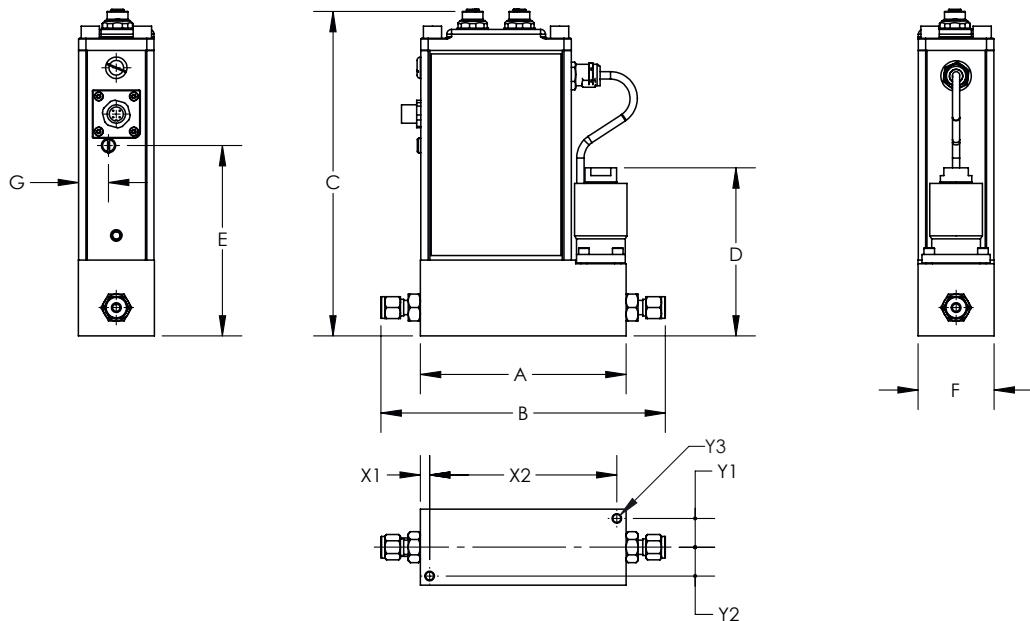
<sup>18</sup> Accuracy at Calibration Conditions; accuracy spec valid across the full control range.

<sup>19</sup> Performance at minimum inlet pressure will be gas and flow range dependent. Consult Applications Engineering for details.

<sup>20</sup> For optimum performance operate at the specified inlet and outlet pressure values.

# Product Dimensions

## SLAMF Sizes - 50, 51, 60, 61



Fittings / Flange - Dimension "B"

Fitting / Flange	50	51 <sup>22</sup>	60	61 <sup>22</sup>
	mm / inch	mm / inch	mm / inch	mm / inch
9/16" - 18 UNF	134.0 / 5.28	148.5 / 5.85	98.6 / 3.88	113.2 / 4.46
1/8" Tube Comp. <sup>21</sup>	180.7 / 7.12	N/A	145.3 / 5.72	N/A
1/4" Tube Comp. <sup>21</sup>	185.3 / 7.30	199.8 / 7.87	149.9 / 5.90	164.5 / 6.48
3/8" Tube Comp. <sup>21</sup>	188.4 / 7.42	202.9 / 7.99	152.9 / 6.02	167.6 / 6.60
1/2" Tube Comp. <sup>21</sup>	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. <sup>21</sup>	185.4 / 7.30	199.9 / 7.87	149.9 / 5.90	164.6 / 6.48
10mm Tube Comp. <sup>21</sup>	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
1/4" RP (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

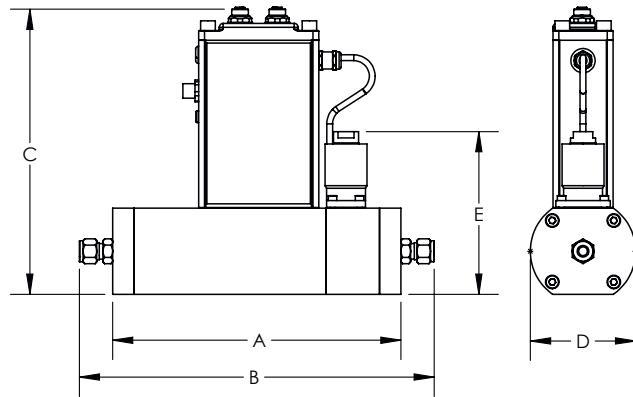
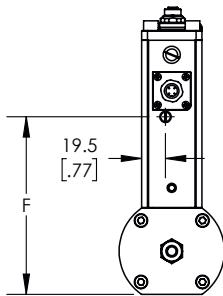
<sup>21</sup> Overall length is finger tight.

<sup>22</sup> Devices with 5848 inlet filter will be 1.41" Longer.

### Electro / Mechanical Dimensions

Model	A	C				D	E			F	G
		Analog RS485		Profibus	DeviceNet		N.C.	N.O.	NO VALVE		
		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	211.4 / 8.32	49.5 / 1.95	109.5 / 4.31	N/A	57.3 / 2.26	124.1 / 4.89	19.5 / .77
51	148.5 / 5.85	200.0 / 7.87	216.2 / 8.51	200.0 / 7.87	211.4 / 8.32	49.5 / 1.95	109.5 / 4.31	N/A	57.3 / 2.26	124.1 / 4.89	19.5 / .77
60	98.6 / 3.88	200.0 / 7.87	216.2 / 8.51	200.0 / 7.87	211.4 / 8.32	49.5 / 1.95	N/A	N/A	N/A	124.1 / 4.89	19.5 / .77
61	113.2 / 4.46	200.0 / 7.87	216.2 / 8.51	200.0 / 7.87	211.4 / 8.32	49.5 / 1.95	N/A	N/A	N/A	124.1 / 4.89	19.5 / .77

## SLAMF Sizes - 53, 63

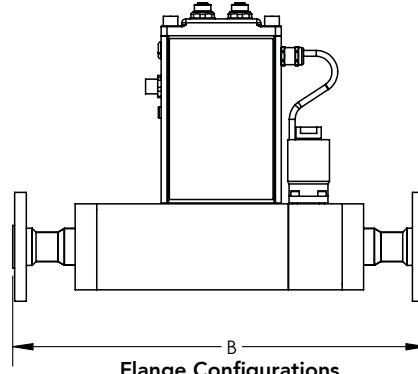
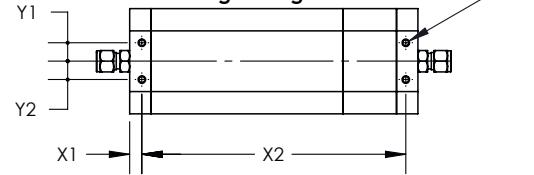


Fittings - Dimension "B"

Fitting	53	63
	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" - 12 UN	235.4 / 9.27	191.6 / 7.54
3/8" Tube Comp. <sup>21</sup>	290.0 / 11.41	245.8 / 9.68
1/2" Tube Comp. <sup>21</sup>	303.5 / 11.95	259.6 / 10.22
3/4" Tube Comp. <sup>21</sup>	303.5 / 11.95	259.6 / 10.22
1" Tube Comp. <sup>21</sup>	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. <sup>21</sup>	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
DIN DN50 PN40	337.4 / 13.28	293.6 / 11.56

<sup>21</sup> Overall length is finger tight.

Fitting Configurations



(4) M6 Mounting Holes

Model	X1	X2	Y1	Y2	Y3
	mm / inch	mm / inch	mm / inch	mm / inch	mm / inch
53	10.0 / .39	215.4 / 8.48	15.0 / .59	15.0 / .59	6.0 / .24
63	10.0 / .39	171.6 / 6.76	15.0 / .59	15.0 / .59	6.0 / .24

Mounting Holes

Model	A	C				D	E	F
		Analog RS485	Profibus	DeviceNet	ProfiNet / EtherNet			
53	235.4 / 9.27	220.8 / 8.69	237.0 / 9.33	220.8 / 8.69	232.2 / 9.14	86.0 / 3.39	132.8 / 5.23	144.9 / 5.70
63	191.6 / 7.54	220.8 / 8.69	237.0 / 9.33	220.8 / 8.69	232.2 / 9.14	86.0 / 3.39	N/A	144.9 / 5.70

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 <sub>2</sub> Equivalent
	1	15 - 150 lpm N <sub>2</sub> Equivalent
	3	100 - 2500 lpm N <sub>2</sub> Equivalent
	4	1000 - 20833 lpm N <sub>2</sub> Equivalent
V. Digital I/O Communication	A	None (select applicable analog I/O)
	D	DeviceNet I/O (with 5-pin micro connector)
	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
	8	PROFINET
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
	1Q	1/4" RP (BSP)
	1T	1/4" RC (BSP)
	1Y	3mm tube compression
	B1	1/4" tube compression with Filter
	C1	1/8" tube compression with Filter
	D1	3/8" tube compression with Filter
	E1	1/4" VCR with Filter
	F1	1/4" VCO with Filter
	G1	1/4" NPT with Filter
	H1	6mm tube compression with Filter
	J1	10mm tube compression with Filter
	L1	3/8" - 1/2" VCR with Filter
	M1	3/8" - 1/2" VCO with Filter
	P1	1/2" tube compression with Filter
	Q1	1/4" RP (BSP) with Filter
	T1	1/4" RC (BSP) with Filter
	Y1	3mm tube compression with Filter
	5A <sup>23</sup>	9/16 - 18 X 1/2" Sanitary
	5B <sup>24</sup>	9/16 - 48 X 3/4" Sanitary

<sup>23</sup> Sanitary Fittings Model Code 5A, 5B, 5C, 5D and 5E are dimensioned in accordance to ASME-BPE and are limited to 500 psi Maximum Pressure.

<sup>24</sup> Material is compliant to 21CFR177.2600 (Title 21 – Food & Drugs, Chapter I - FDA).

Code Description	Code Option	Option Description
VI. Mechanical Connection (Body size 3 unless noted otherwise)	2A	Without adapters, 9/16" - 18 UNF
	2B	Without adapters, 1-1/16" - 12 UN-2B
	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	Without adapters, 1 - 5 / 16"-12 UN-2B
	2S	1" VCO
	2T	3/4" VCR
	2U	1" VCR
	2W	2" NPT Size 4 only
	2X	12 mm tube compression
	3A	DIN DN15 PN40 Flange
	3B	DIN DN25 PN40 Flange
	3C	DIN DN40 PN40 Flange
	3D	DIN DN50 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
	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 <sup>23</sup>	1 1/16 - 12 X 1/2" Sanitary
	5D <sup>23</sup>	1 1/16 - 12 X 3/4" Sanitary
	5E <sup>23</sup>	1 1/16 - 12 X 1" Sanitary
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/FKM <sup>24</sup> (Not available in Size 4)
	L	FDA/USP Class VI - EPDM (Not available in Size 4)

<sup>23</sup> Sanitary Fittings Model Code 5A, 5B, 5C, 5D and 5E are dimensioned in accordance to ASME-BPE and are limited to 500 psi Maximum Pressure.

<sup>24</sup> Material is compliant to 21CFR177.2600 (Title 21 – Food & Drugs, Chapter I - FDA).

Code Description	Code Option	Option Description		
VIII. Valve Seat	A	None (Sensor only)		
	B	Viton (for body size 3, diaphragm material = Viton)		
	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 (for body size 3, diaphragm material = PTFE)		
	G	Metal (for body Size 3, diaphragm material = PTFE)		
	J	FDA / USP Class VI and ADI Free - Viton / FKM <sup>24</sup> (for body size 3, diaphragm material = FDA/USP Class VI Viton / FKM)		
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	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		
	S	Biotech Performance Package <sup>26</sup>		
	T	Biotech Premium Package <sup>27</sup>		
	U <sup>25</sup>	Performance Package with CO <sub>2</sub> Calibration		
	V <sup>25</sup>	Premium Package with CO <sub>2</sub> 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		
	7 <sup>28</sup>	JPEx		

<sup>24</sup> Material is compliant to 21CFR177.2600 (Title 21 – Food & Drugs, Chapter I - FDA).

<sup>25</sup> CO<sub>2</sub> Actual Gas Calibration available for SLA5850/60 & SLA5851/61.

<sup>26</sup> Performance Package must be ordered for basic Biotech model features.

<sup>27</sup> Premium Package includes Performance Package features.

<sup>28</sup> JPEx only available with Digital I/O Communication "S" option.

#### Sample Model Code

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

# Approvals, Certifications and Services

## Product Approvals Overview

Mark	Agency	Certification	Applicable Standard	Details
	UL (Recognized)	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	EMC Directive 2014/30/EU Directive 2011/65/EU	EN:61326-1:2013	EMC RoHS
	JPEx	Ex ec IIC T4 Gc Ex tc IIIC T 85 °C Dc IP66	JNIOSH-TR-46-1:2020 JNIOSH-TR-46-5:2018 JNIOSH-TR-46-9:2018	DEK23.0039X DEK23.0040X DEK24.0048X DEK24.0049X

ATEX/IECEx/JPEx 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](http://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.

### TRADEMARKS

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