

## ISO/IEC 17025 Calibration Certificate

201 Wolf Drive • P.O. Box 87 • Thorofare, NJ 08086-0087 • Phone: 856-686-1600 • Fax: 856-686-1601 • www.troemner.com • e-mail: troemner@troemner.com

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### Flow-Controller Calibration

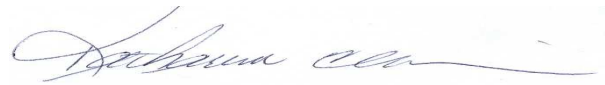
**SECTION 1: NAME AND ADDRESS OF CUSTOMER**  
 Troemner, LLC  
 201 Wolf Dr.  
 Thorofare, NJ 08086

Certificate Number: 123456-TMF  
 Serial Number: 12345678910  
 ID #: 12345678910

Calibration Due Date: 17-Feb-2018

**SECTION 2: APPROVED SIGNATORY**

Katharine Ellison, Metrologist



**SECTION 3: PERSON PERFORMING WORK**

David Peacock

**SECTION 4: CERTIFICATE INFORMATION**

Description of DUT:	Flow Controller	Date Received:	10-Feb-2017
Order Number:	Customer PO#	Date of Calibration:	17-Feb-2017
Manufacturer:	Brooks Instruments	Date of Issue:	20-Feb-2017
Model:	5850TRGA1C2B3	Flow Range:	500 mL/min @ 32.0 °F
Serial Number:	12345678910	Calibration Gas:	N2
Inlet Pressure:	14.5 psig	Process Gas:	N2
Outlet Pressure:	Atmosphere	K Factor:	1
Attitude:	#1 Horizontal Base Down		

**SECTION 5: ENVIRONMENTAL CONDITIONS DURING TEST**

Ambient Temp.: 21.55 °C      Ambient Pressure: 757.30 mmHg      Ambient RH: 22.5 %

**SECTION 6: PERTINENT INFORMATION**

Standards				
Manufacturer	Model	Serial Number	Cal Due Date	Description
DH Instruments Inc	Molbox1	312	1-Nov-2017	Molbox
DH Instruments Inc	5E2-VCR-V-Q	1494	1-Feb-2018	Molbloc

The DUT calibrated for this report has been calibrated in accordance with Troemner's calibration procedure TMF-CAL. This calibration also meets specifications as outlined in ISO/IEC 17025, ANSI/NCSL Z540-1-1994 and applicable documents. This comparison calibration was performed in Troemner's Mass Flow Calibration Laboratory at 201 Wolf Drive, Thorofare, NJ 08086 unless otherwise noted. The instrument was compared to a laboratory standard, which is traceable through a National Measurement Institute (NMI) to the International System of Units (SI).

If reported, tolerances represent manufacturer stated accuracy unless noted otherwise. No statement of compliance with specifications is made on this certificate. DUT was found to be within tolerance except where noted by an asterisk (\*).

**SECTION 7: DEFINITIONS AND TERMS**

**UNCERTAINTY**- The error in assignment of flow due to the measurement process. Uncertainty is calculated per NIST Technical Note 1297 using a coverage factor of k = 2 (k = 2 defines an interval having a level of confidence of approximately 95 percent).

**DUT**- Device Under Test. Item being calibrated.

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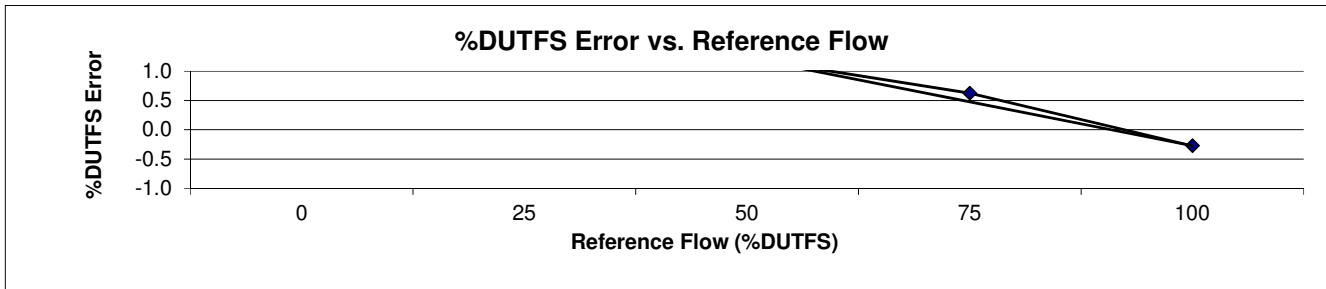
#### SECTION 8: CALIBRATION DATA

##### AS FOUND DATA

**Tolerance:** 1% DUTFS      **Uncertainty of Measurement:** 0.81 % of Reading

Command (% of F.S.)	Signal Output (V)	Actual Flow (mL/min)	Error (% of F.S.)	Status (Pass or Fail)
0	0.169	0.000	3.380 *	Fail
25	1.234	113.877	1.905 *	Fail
50	2.489	242.764	1.227 *	Fail
75	3.740	370.867	0.627	Pass
100	4.991	500.464	-0.273	Pass
50	2.492	242.014	1.437 *	Fail
0	0.169	0.000	3.380 *	Fail

\*Denotes Out of Tolerance condition



##### AS LEFT DATA

**Tolerance:** 1% DUTFS      **Uncertainty of Measurement:** 0.81 % of Reading

Command (% of F.S.)	Signal Output (V)	Actual Flow (mL/min)	Error (% of F.S.)	Status (Pass or Fail)
0	0.002	0.000	0.040	Pass
25	1.249	128.135	-0.647	Pass
50	2.503	252.194	-0.379	Pass
75	3.755	375.547	-0.009	Pass
100	5.007	500.220	0.096	Pass
50	2.505	251.453	-0.191	Pass
0	0.002	0.000	0.040	Pass

