August 24, 2016

Public Service Commission
600 East Boulevard Avenue, Dept. 408
Bismarck, ND 58505-0480

Re: Variance Permit Request for Portable Small Volume Prover
Owner/Operator: NuStar Pipeline Operating Partnership L.P.
Locations:
Jamestown North Terminal, 3598 74th Avenue S.E., Jamestown, ND 58401
Jamestown East Terminal, 3790 Hwy 281 SE, Jamestown, ND 58401
Prosper Junction, 46°56'57.74°N Latitude, 96°59'7.76°W Longitude
Mandan Station, 1000 Red Trail, Mandan, ND 58554
Burlington North Railroad, 600 Burlington St. SE, Mandan, ND 58554
Prover: Daniel Measurement and Control, Inc., Small volume prover, serial # 1604-16501-1-1, capacity 15 gallons

Dear Public Service Commission,

In accordance with NDAC Chapter 69-10-01-04.1, NuStar Pipeline Operating Partnership L.P. (NuStar) requests the grant of a variance permit for the portable small volume prover providing proving services to NuStar owned meters at the above referenced locations. NDAC Chapter 69-10-03-02 requires standards used to certify commercial weighing and measuring devices to be certified by a NIST-recognized metrology lab. The specialized functionality of the small volume prover is to produce a meter factor for the volume of product coming through the "in-line" meters at these locations. The meter factor is used in configuring an invoice from volume of product passing through the meter into storage tanks or transport trucks at the locations. The prover is used monthly on the pipeline meters and quarterly on truck loading meters, providing a meter factor for each product moved through the meter.

In order to satisfy the requirement for the water draw certification of our small volume to be completed by a NIST-certified laboratory, NuStar must transport our equipment and personnel to the nearest NIST-certified laboratory in Michigan. In December 2013, NuStar complied with the state requirement by transporting our prover to the Michigan NIST-certified laboratory. Upon arrival at the NIST-certified laboratory, our measurement specialists were informed the laboratory would only supply the weighing scale, calibration weights, and water tank to perform the gravimetric water draw certification. NuStar had to obtain and assemble a water draw certification system and assist in performing the water draw certification at the NIST-certified laboratory. Although the NIST laboratory charge for certification was not significant, when combined with the hard dollar expense for travel and time, it was significantly greater than the amount incurred when using a local third party measurement company that specializes in performing the certification in accordance with API MPMS with NIST traceable equipment.

NuStar recently purchased a new Daniel Measurement and Control small volume prover, and included in the purchase of the prover was a water draw certification performed by Daniel Measurement and Control personnel at their Houston, Texas facility. The calibration was completed in accordance with API MPMS using NIST traceable equipment. Please see the attached Daniel water draw certification and NIST traceability documentation for consideration. NuStar requests a variance permit to accept the certification of the small volume prover by David Measurement and Control and to acknowledge NuStar as compliant with the requirement to calibrate the prover once every three years.

Please do not hesitate to contact me if you need any additional information or if you have any questions or comments. I can be reached at (210) 918-2105, and my email address is Marc.Buentello@nustarenergy.com.

Sincerely,

Marc Buentello

Marc Buentello
Senior Manager, Dynamic Flow Measurement

Attachment: NuStar 12in 600# Compact Prover 16501-12-1290-01-001-Certification.pdf

Compact Prover Calibration Certificate

Daniel Measurement and Control, Inc.
5650 Brittmoore Rd., Houston Tx 77041

Customer Name: Nustar Logistics
Customer Address: 513-A Main St.
Sunray, Tx 79086
Customer's Order No: 4501420057
Customer's Tag No:
Serial Number: 1604-16501-1-1
Prover Model No.: P121C6A1A122AAE
Daniel Order No.: 16501
Prover Size: 12
Calibration fluid: Water
"M"-metric or "E" - English: E

Test Measure NIST Seal #: 7227
*Flow Tube Material: A
Coef. of Exp. for Test Measure(Sq): 0.0000265
Flow tube I.D.(D)inch: 12.25
Wall Thickness(t)inch: 0.875
No. of Runs: 3
Test Measure Volume-in^3: 3462.7
Base temperature,Tb: 60 ° F

* A=17-4 ST STL
B=304 ST STL
C=316 ST STL

Date: 4/28/2016
Certification Number: 16041650111
Estimated Uncertainty: Dwnstrm +/- 0.034% Upstrm +/- 0.034%
Error Band: 0.02% (Percent Repeatability)
Coverage Factor: K = 2
Confidence Level: Approximately 95 %
Calibration Procedure: T-00101 Rev G

RUN NUMBER	1	2	3	4	5
SECTION A - MANUAL ENTRIES					
Average prover temperature, Tp	75.00	75.50	75.60		
Test measure temperature, Tm:	75.00	75.40	75.60		
Correction for thermal expansion of detector mount, Td:	72.70	73.50	74.00		
Water pressure-psig,P	31.6	34.4	31.6		
Test Measure Scale Reading	14.75	15	14.75		
SECTION B - CALCULATED ENTRIES					
Gross Water draw volume,Vm-gallons	15.0537	15.0548	15.0537	0.0000	0.0000
Temp. differential correction factor, Tmp:(API 12.1)	1.000000	1.000014	1.000000	1.000000	1.000000
Correction factor for (Tm,Tp,&Td), Css:	1.000208	1.000211	1.000215	0.999177	0.999177
Correction factor for Cpl:	1.000101	1.000110	1.000101	1.000000	1.000000
Correction factor Cps:	1.000016	1.000017	1.000016	1.000000	1.000000
Prover volume - Vtp	15.0550	15.0562	15.0552	0.0000	0.0000
Percent Repeatability (%)					0.00797
				Comply?	YES
Net Prover base volume at Tb in °F and 0 psig		**Downstream**		15.0555	Gallons

1	2	3	4	5
75.40	75.70	75.60		
75.40	75.60	75.60		
73.10	73.50	74.10		
32.2	34.6	32.2		
-13.5	-13.75	-13.75		
14.9314	14.9303	14.9303	0.0000	0.0000
1.000000	1.000014	1.000000	1.000000	1.000000
1.000213	1.000214	1.000215	0.999177	0.999177
1.000103	1.000111	1.000103	1.000000	1.000000
1.000016	1.000017	1.000016	1.000000	1.000000
14.9328	14.9318	14.9317	0.0000	0.0000
				0.00737
			Comply?	YES
Upstream			14.9321	Gallons

Calculations based on the following formulae:

Vtp = (Vm x Tmp x Css) / (Cpl x Cps)

Css = Correction factor for test measure, prover, & invar rod=

$$\frac{1 + (Tm-Tb)Sq}{(1+(Tp-Tb).0000120)(1+(Td-Tb).0000008)}$$

Cpl = compressibility reduction factor for water
1/(1-(.0000032 x P))

Cps = pressure correction factor for prover
1+ (P x D)/(28.5E6 x t)

Statement of compliance are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the prover calibrated.

LABORATORY ACCREDITATION BUREAU ACCREDITED ISO/IEC 17025
Certificate # L2309 - Calibration

Calibrator: Clifton Vaughn
Title: Lab Technician
Approver: David Molloy
Title: Engineering Manager

This prover has been calibrated using standards with accuracies traceable through National Institute of Standards and Technology to the *Si*. Derived from natural physical constants, derived from ratio measurements, or compared to concensus standards.

This revision of the certificate supercedes any previous revisions.
Form T00101A Revision C

EMERSON. Process Management

Compact Prover Volumetric Calibration Data Sheet
Daniel Measurement and Control, Houston, Tx. USA

DANIEL

This form is a supplement to Certification Number 16041650111

Customer: NUSTAR LOGISTICS
Serial No.: 1604-16501-1-1
Model No.: P12C6A1A1ZZ.AAE
Cust. Order No.: 4501420057
Calibrated Measure's Volume 3462.7 IN³@60°F
Test Measure NIST Seal #: 7227

Date: APRIL-28-2016
Nit. Tank Serial No. 15143-11
Calibrated Measure's Units mL (in3) (Circle One)

Units of Measure: Temp °C (°F) (Circle One) Pressure kPa (psig) (Circle One) Scale Increments .50 mL (In3)

Downstream Volume Runs

	1	2	3	4	5
Water Temp Inlet (T1)	75.00	75.60	75.60		
Water Temp Outlet (T2)	75.00	75.40	75.60		
Prover Temp (Tp)	75.00	75.50	75.60		
Test Measure Temp (Tm)	75.00	75.40	75.60		
Sensor Mounting Temp (Td)	72.70	73.50	74.00		
Water Pressure (P)	31.60	34.40	31.60		
Test Measure Scale Reading	+14.75	+15.0	+14.75		
Pass Time (sec)	1:46.22	3:17.66	1:45.31		

Upstream Volume Runs

1	2	3	4	5
75.40	75.80	75.60		
75.40	75.60	75.60		
75.40	75.70	75.60		
75.40	75.60	75.60		
73.10	73.50	74.10		
32.20	34.60	32.20		
-13.50	-13.75	-13.75		
1:50.00	3:29.37	1:50.78		

Tp = SVP water temperature, Average of T1 and T2
Tm = Temperature of water in Test Measure
P = Water presser during test draw
Td = Temperature of Displacer position sensors

Calibrator [signature]

Witness [signature]

Calibration Identification Numbers

Inlet Thermometer 340226
Outlet Thermometer 368183
Tank Thermometer 340223
Sensor Thermometer 21460126
Pressure Gauge 29900397/1

21460126

Leak Detector Test Results

0 Inches in 5 Minutes

T00101B Revision B

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-8361

REPORT OF CALIBRATION

FOR

A FIFTEEN (15) GALLON VOLUME PROVER
(Graduated Neck Type)

February 25, 2014

Manufacturer: Seraphin
Rancocas, NJ

NIST Seal Number: 7227
NIST Valve Seal No.: 001049
Material: Stainless Steel
Serial Number: 11888A

submitted by

Daniel Measurement and Control
5650 Brittmoore Road
Houston, TX 77041

(Reference: Purchase Order Number 4105014539; dated December 18, 2013)

The volume of the prover described above was measured by the gravimetric method [1] and the standards used in this calibration are traceable to the System International through national standards. The gravimetric method uses the weight of the fluid necessary to fill the prover and the fluid density to calculate the volume. The fluid used was water from a reverse osmosis system and the prover was leveled using the vertical surface of the neck.[#]

The contained volume was drained from the prover by opening the valve at the bottom of the vessel. When this flow finished, the valve was held open for 30 seconds to complete the drain procedure. The delivered volume is for the scale reading of zero (0) and has been corrected for the reference temperature in Table 1 assuming a volumetric coefficient of expansion of 0.0000477 per °C (0.0000265 per °F) for the prover material.

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1 Bean, V. E., Espina, P. I., Wright, J. D., Houser, J. F., Sheckels, S. D., and Johnson, A. N., "NIST Calibration Services for Liquid Volume," NIST Special Publication 250-72, National Institute of Standards and Technology, November 24, 2009.

[#] One level indication was made in line with the neck scale and the other 90° to that indication, as stated in API MPMS Chapter 4.7. The levels on the can were not used.

Table 1. Delivered volume for the tested vessel for a scale reading of zero.

	Volume Delivered
gal at 60 °F	**14.9898**
in^3 at 60 °F	**3462.65**

The volume measurement procedure was repeated 5 times with the neck scale filled approximately to zero each time. The repeatability of the 5 measurements was 21 parts in 10^6 and the expanded uncertainty in the measured volume is ±0.030%. It was calculated according to References [1] and [2] with a 95 % confidence level† and is traceable to NIST mass, temperature, pressure, and humidity standards, and a NIST water density determination.

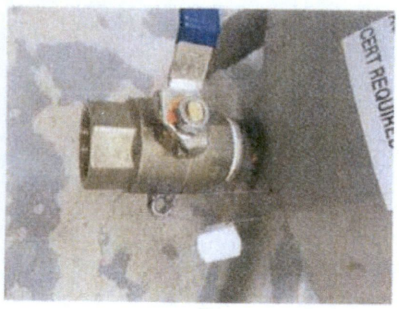

Figure 1. Photographs of the volume prover.

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[2] Taylor, B. N. and Kuyatt, C. E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results," NIST Technical Note 1297, National Institute of Standards and Technology (January 1993).

† Coverage factor of 1.96 for 12732 effective degrees of freedom.

The input data used for calculation of the prover volume are given in the spreadsheet attached to this report. The calibration and uncertainties presented here are only valid over the range of the NIST calibration of this test measure. When the test measure is applied by the customer to measure liquid volume, uncertainties beyond the NIST calibration must be considered, for example: leveling of the test measure, reading the meniscus, cleanliness of the test measure interior, drainage effects due to liquid viscosity, etc.

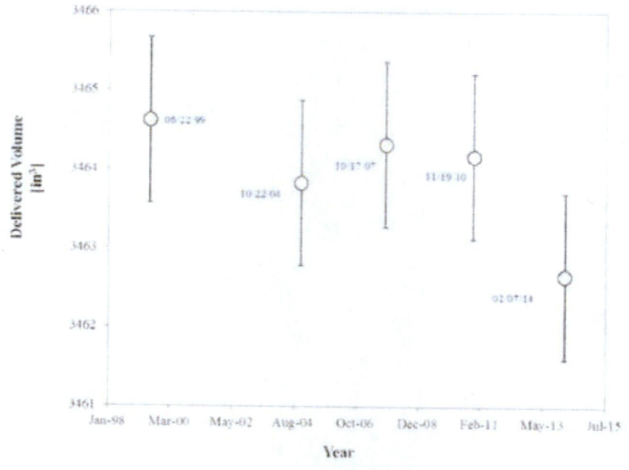


Figure 2. Calibration control chart for 15 gallon graduated neck test measure SN 11888A.

Table 2. Results of prior calibrations for the delivered volume.

Date	*Delivered Volume [in³]*	*Difference from Prior [in³]*	*Degree of Equivalence [-]*
02/07/14	3462.65	-1.51	-0.88
11/19/10	3464.17	-0.15	-0.09
10/17/07	3464.32	0.49	0.28
10/22/04	3463.83	-0.79	-0.46
06/22/99	3464.62	0.00	0.00

For the Director,
National Institute of Standards and Technology

John D. Wright

Dr. John D. Wright
Project Leader
Fluid Metrology Group
Physical Measurement Laboratory
National Institute of Standards and Technology

Sherry Sheckels

Sherry Sheckels
Calibration Technician
Fluid Metrology Group
Physical Measurement Laboratory
National Institute of Standards and Technology

NIST Seal No.: 7227
Serial No. 11888A

REPORT OF CALIBRATION
Daniel Measurement and Control

Service ID No.: 17010C

NIST Test Number: 685/284723-14-02
Calibration Date: February 2, 2014 by Sherry Sheckels and John Wright

Name of Company: Daniel Measurements
NIST Seal Number: 7227
Serial Number: 11888A
Nominal Volume of Vessel: 15 gallons
Nominal Vol per Scale Div: 0.5 cubic inches
Date Calibrated: 2/7/2014

Scale Capacity: 600 [kg]
Scale a_1 1.0010E+00 [1/kg]
Scale a_2 -3.7728E-07 [1/kg^2]
Cal Date: 2/6/2014

T#1 a_0 1.528053E-02 [C]
T#1 a_1 9.986196E-01 [1/C]
Cal Date: 1/29/2013
T#2 a_0 1.168537E-02 [C]
T#2 a_1 9.991008E-01 [1/C]
Cal Date: 1/29/2013

T#3 a_0 -3.17042E-03 [C]
T#3 a_1 9.997008E-01 [1/C]
Cal Date: 1/29/2013
T#4 a_0 0.000000E+00 [C]
T#4 a_1 1.000000E+00 [1/C]
Cal Date: 1/29/2013

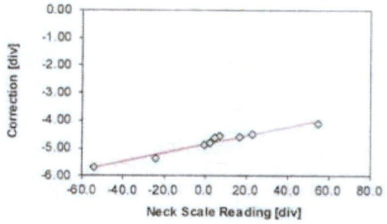
Water Temperature			Water Density	Air Temperature			Barometric Pressure		Rel. Humidity	Air Density
Corrected #1	Corrected #2	Average	Patterson & Morris	Corrected #3	Corrected #4	Average	Read		Read	Jaeger & Davis
[C]			[kg/m^3]	[C]			[kPa]	[Pa]	[%]	[kg/m^3]
27.084	27.089	27.087	996.490	21.881	21.909	21.895	101.10	101,100	25.1	1.19114
27.341	27.348	27.345	996.419	21.674	21.728	21.701	101.09	101,089	25.3	1.19181
27.351	27.359	27.355	996.416	22.644	22.850	22.747	101.10	101,096	26.7	1.18732
27.376	27.381	27.378	996.409	22.149	22.085	22.117	101.11	101,105	27.4	1.19000
27.374	27.378	27.376	996.410	21.305	21.349	21.327	101.09	101,088	26.8	1.19320

Weight Dry		Weight Full		Weight Drained		Scale Reading		Uncorrected Prover Volume	
Read	Corrected	Read	Corrected	Read	Corrected	Read	Corrected	Contained	Delivered
[kg]		[kg]		[kg]		[div]	[m^3]	[m^3]	
92.9910	93.0827	149.6221	149.7663	93.0242	93.1158	17.5	0.000143	0.056808	0.056775
92.9910	93.0827	149.5407	149.6849	93.0232	93.1149	8.0	0.000066	0.056808	0.056776
92.9910	93.0827	149.4978	149.6420	93.0230	93.1147	3.0	0.000025	0.056806	0.056774
92.9910	93.0827	149.5188	149.6630	93.0227	93.1144	5.5	0.000045	0.056807	0.056775
92.9910	93.0827	149.4740	149.6181	93.0248	93.1165	0.0	0.000000	0.056807	0.056773

Neck Scale Calibration

Reading	calculated	correction
[div]	[div]	[div]
17.5	12.9	-4.6
8.0	3.4	-4.6
3.0	-1.8	-4.8
5.5	0.9	-4.6
0.0	-4.9	-4.9
-54	-59.7	-5.7
-23.5	-28.9	-5.4
23.5	19.0	-4.5
55	50.9	-4.1
slope	intercept	
1.015	-4.70	[div]
0.508	-2.35	[in^3]
8.318E-06	-3.851E-05	[m^3]

Ref. Temp.	Thermal Expansion Corrected Prover Volume							Water		
[C]	Contained	Delivered	Contained	Delivered	Contained	Delivered	$\Delta x / \sigma_x$	Temperature	Density	Kin. Visc.
15.56	[m^3]		[gal]		[in^3]				Patterson & Morris	CRC & Kell
	0.05677677	0.05674347	14.9988	14.9900	3464.73	3462.70	0.66	[C]	[kg/m^3]	[m^2/s]
	0.05677623	0.05674391	14.9987	14.9902	3464.70	3462.73	1.04	15.560	999.015	1.125E-06
	0.05677392	0.05674180	14.9981	14.9896	3464.56	3462.60	0.77	27.308	996.429	8.519E-07
	0.05677498	0.05674316	14.9984	14.9900	3464.62	3462.68	0.39			
	0.05677515	0.05674116	14.9984	14.9894	3464.63	3462.56	1.32			
	0.0567754	0.0567427	14.9985	14.9898	3464.65	3462.65	Averages, Thermal Expansion Corrected			
		0.0567378		14.9885		3462.35	Averages, Therm. Exp. & Viscosity Corrected			
	20	21	20	21	20	21	Repeatability [x 10^{-6}]			
	0.029	0.030	0.029	0.030	0.029	0.030	Expanded Uncertainty [%]			



maker: Seraphin
min scale: -32
max scale: 32
levels: on neck
valve: ball valve
old / new: old
drain time (s): 30

Estimation of Uncertainty **k= 1.96** **ν_{eff}= 12732** 95% confidence, Taylor & Kuyatt

x_i	Value	$1/V\ \delta V/\delta x_i$	Value of $1/V\ \delta V/\delta x_i$	$u(x_{ii})$ for k=1	$1/V\ \delta V/\delta x_i u(x_{ii})$ [x 10^{-6}]
h	— [m^3]	$1/V$	0 [1/m^3]	2.0E-06 [m^3]	0.1
m_t	149.67 [kg]	$1/(m_t-m_a)$	0.02 [1/kg]	5.8E-03 [kg]	102.0
m_a	93.08 [kg]	$-1/(m_t-m_a)$	-0.02 [1/kg]	5.8E-03 [kg]	-102.0
ρ_a	1000 [kg/m^3]	$-1/\rho_a$	-1E-03 [m^3/kg]	2.0E-03 [kg/m^3]	-2.0
β_W	2.0E-04 [1/C]	$-(T_W-T_{ref\,W})$	-23.3 [C]	3.3E-07 [1/C]	-7.7
β_t	4.8E-05 [1/C]	$-(T_W-T_{ref})$	-11.7 [C]	7.0E-07 [1/C]	-8.2
T_W	27.3 [C]	$\beta_W-\beta_t$	2E-04 [1/C]	4.0E-02 [C]	6.1
ρ_{air}	1.19 [kg/m^3]	$1/\rho_a$	1E-03 [m^3/kg]	2.0E-03 [kg/m^3]	2.0
v					49.6

Calibration Certificate

Instrument Information

Equipment ID:	01412137	**Serial No:**	01412137
Description:	0-3000 P.S.I., 0-120 F.	**Status:**	Active
Model No:	PRESS. & TEMP. RECORDER	**Department:**	Compact Provers
Manufacturer:	FOXBORO	**Location:**	B-9 PROVER ASSEMBLY

Calibration Summary

Calibrated:	09/06/2014	**Frequency:**	SemiAnnual	**Temp:**	72F	**As Found:**	In Tolerance
Next Cal:	03/06/2015			**Humidity:**	0%	**Result:**	Pass

Remarks: PROVERS: IN TOL.,NO ADJUSTMENT MASTER: 2816: NECESSARY 4/7/11,IN TOL., NO ADJ. NECESSARY, 11/11/09, IN TOL., NO ADJ. NECESSARY, 4/29/10, IN TOL.,NO ADJ. NECESSARY, 9/30/10, INTOL, IN TOL. 10/10/11,NO ADJ. IN TOL.3/6/12,NO ADJ. IN TOL.8/2/12,NO ADJ. IN TOL. 1/24/13,NO ADJ. IN TOL.4/15/13, NO ADJ. IN TOL. 9/3/13,NO ADJ. IN TOL. 3/4/14,/3/13,NO ADJ. IN TOL.9/6/14,

Measurement Group 1

Tol Type: Tolerance (+/-) **As Found:** In Tolerance

Units: **Result:** Pass

Cal'd By: TE 0-3000 PSI

Notes: MASTER:14041 DEAD WIEGHT TESTER

Calibration Standard Model: CHANDER ENIGENEERING

Desc:	50-15,000 PSI		
ID:	14041	**Last Cal:**	3/6/2014
Serial:	14041	**Next Cal:**	3/6/2016
Status:	Active	**Cert:**	

		Limits		As Found			As Left (Cal Status)		
Desc	Nominal	Upper	Lower	Actual	Error	Result	Actual	Error	Result
	3000.0000	3000.5000	2999.5000	3000.0000	0000.0000	Pass	3000.0000	0000.0000	Pass
	0750.0000	0750.5000	0749.5000	0750.0000	0000.0000	Pass	0750.0000	0000.0000	Pass
	1500.0000	1500.5000	1499.5000	1500.0000	0000.0000	Pass	1500.0000	0000.0000	Pass
	2250.0000	2250.5000	2249.5000	2250.0000	0000.0000	Pass	2250.0000	0000.0000	Pass
	3000.0000	3000.5000	2999.5000	3000.0000	0000.0000	Pass	3000.0000	0000.0000	Pass

Approved By: Jomar Cooker **Date:** 1-12-15

Metrology Service

ACCREDITED
CALIBRATION Certificate # 1297.01

Certificate of Calibration

1000361933

Customer Information

Daniel Measurement & Control, Inc.
11100 Brittmoore Park Drive
Houston, TX 77041

PO #: 4105025496

Account #: DA1398
SO #: 108524

Instrument Identification

Instrument Id: **3Y0226**

Noun: Thermometer
Serial #: 3Y0226
Mfr: Miller & Weber
Model: T-3426/SAMA FP40Y
Accuracy: ± 0.2°F
Expanded Measurement Uncertainty at K=2: ± 0.05°F

Certification Information

Reason For Service: Calibration
Type Of Calibration: Accredited
As Found Condition: In Tolerance
As Left Condition: Left As Found
Procedure: 33K5-4-42-1 : Thermometers Rev 0, 01/06
Technician Remarks: IAW S-01923
Quality Remarks: Calibration complies with ISO/IEC 17025:2005 & ANSI/NCSL Z540-1-1994 requirements.

Technician: Wayne Hutchinson
Cal Date: 02 SEP 14
Cal Due: 02 SEP 15
Temperature: 21.0 °C
Humidity: 35.0 %

This instrument has been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology, derived from natural physical constants, derived from ratio measurements, or compared to consensus standards.

Reported uncertainties and/or test uncertainty ratios(TUR's) are expressed as expanded uncertainty values at approximately the 95% confidence level using a coverage factor of K=2.

Statements of compliance, where applicable, are based on test results falling within specified limits with no reduction by the uncertainty of the measurement.

Certified Measurements, Inc.'s Quality System complies with the applicable requirements of ANSI/NCSL Z540-1 and ISO/IEC 17025.

The results contained herein relate only to the item calibrated. Calibration due dates appearing on the Certificate of Calibration and label are determined by the client for administrative purposes and do not imply continued conformance to specification.

Deborah J. Nazimiec, Technical Manager

Edvaldo Calvao, President

Your calibration records are available on-line at http://www.cmimetrology.com

Printed: 02 Sep 2014 11:26 AM

CERTIFIED MEASUREMENTS, INC.
Raising the Calibration Standard...

510 North Houston Lake Blvd.
Centerville, Georgia 31028
Tel: 478.953.5171
Fax: 478.953.2688

Metrology Service

ACCREDITED
CALIBRATION Certificate # 1287.01

Certificate of Calibration

1000361933

✓ In Tolerance ✗ Out of Tolerance

Calibration Data

Range	Nominal	As Found		As Left		Min	Max
Indication at Known Temp.							
Temp °F	32.0	32.00	✓	Left as Found	■	31	33
	60.0	60.00	✓	Left as Found	■	59	61
	100.0	100.10	✓	Left as Found	■	99	101

End of Datasheet

Calibration Standards

NIST Traceable #	Instrument ID#	Description	Model	Calibration Date	Date Due
1000354059	25080	Thermometer Indicator	1502A	09 APR 2014	31 OCT 2014
1000356954	05618	Platinum Resistance Thermometer	5618	10 JUN 2014	30 JUN 2015

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Metrology Service

ACCREDITED
CALIBRATION Certificate # 1297.01

Certificate of Calibration

1000380451

Customer Information

Daniel Measurement & Control, Inc.
11100 Brittmoore Park Drive
Houston, TX 77041

PO #: 4105041110

Account #: DA1398
SO #: 114141

Instrument Identification

Instrument Id: **4G8183**

Noun: Thermometer
Mfr: Miller & Weber
Model: T-3426/SAMA FP40Y
Accuracy: ± 0.2°F
Expanded Measurement Uncertainty at K=2: ± 0.05°F

Serial #: 4G8183

Certification Information

Reason For Service: Calibration
Type Of Calibration: Accredited
As Found Condition: In Tolerance
As Left Condition: Left As Found
Procedure: 33K5-4-42-1 : Thermometers Rev 0, 01/06
Technician Remarks: Per Specification S-01923, rev. C
Quality Remarks: Calibration complies with ISO/IEC 17025:2005 & ANSI/NCSL Z540-1-1994 requirements.

Technician: Wayne Hutchinson
Cal Date: 09 SEP 15
Cal Due: 09 SEP 16
Temperature: 22.0 °C
Humidity: 45.0 %

This instrument has been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology, derived from natural physical constants, derived from ratio measurements, or compared to consensus standards.

Reported uncertainties and/or test uncertainty ratios(TUR's) are expressed as expanded uncertainty values at approximately the 95% confidence level using a coverage factor of K=2.

Statements of compliance, where applicable, are based on test results falling within specified limits with no reduction by the uncertainty of the measurement.

Certified Measurements, Inc.'s Quality System complies with the applicable requirements of ANSI/NCSL Z540-1 and ISO/IEC 17025.

The results contained herein relate only to the item calibrated. Calibration due dates appearing on the Certificate of Calibration and label are determined by the client for administrative purposes and do not imply continued conformance to specification.

Deborah J. Nazimiec, Technical Manager

Edvaldo Calvao, President

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Certificate of Calibration

1000380451

✓ In Tolerance ✗ Out of Tolerance

Calibration Data

Range	Nominal	As Found		As Left		Min	Max
Indication at Known							
Temp °F	32.0	32.1	✓	Left as Found	▪	31.0	33.0
	60.0	60.1	✓	Left as Found	▪	59.0	61.0
	100.0	100.0	✓	Left as Found	▪	99.0	101.0

End of Datasheet

Calibration Standards

NIST Traceable #	Instrument ID#	Description	Model	Calibration Date	Date Due
1000372622	05618	Platinum Resistance Thermometer	5618	10 APR 2015	31 OCT 2015
1000372730	25080	Thermometer Indicator	1502A	07 APR 2015	31 OCT 2015
1000376903	27842	Temp/Humidity Indicator with Probe	HMI 41/HMP 46	07 JUL 2015	31 JAN 2016

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Certificate of Calibration

1000361932

Customer Information

Daniel Measurement & Control, Inc.
11100 Brittmoore Park Drive
Houston, TX 77041

PO #: 4105025496

Account #: DA1398

SO #: 108524

Instrument Identification

Instrument Id: **3Y0223**

Noun: Thermometer — Serial #: 3Y0223

Mfr: Miller & Weber

Model: T-3426/SAMA FP40Y

Accuracy: ± 0.2°F

Expanded Measurement Uncertainty at K=2: ± 0.05°F

Certification Information

Reason For Service: Calibration

Type Of Calibration: Accredited

As Found Condition: In Tolerance

As Left Condition: Left As Found

Procedure: 33K5-4-42-1 : Thermometers Rev 0, 01/06

Technician Remarks: IAW S-01923

Technician: Wayne Hutchinson

Cal Date: 02 SEP 14

Cal Due: 02 SEP 15

Temperature: 21.0 °C

Humidity: 35.0 %

Quality Remarks: Calibration complies with ISO/IEC 17025:2005 & ANSI/NCSL Z540-1-1994 requirements.

This instrument has been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology, derived from natural physical constants, derived from ratio measurements, or compared to consensus standards.

Reported uncertainties and/or test uncertainty ratios(TUR's) are expressed as expanded uncertainty values at approximately the 95% confidence level using a coverage factor of K=2.

Statements of compliance, where applicable, are based on test results falling within specified limits with no reduction by the uncertainty of the measurement.

Certified Measurements, Inc.'s Quality System complies with the applicable requirements of ANSI/NCSL Z540-1 and ISO/IEC 17025.

The results contained herein relate only to the item calibrated. Calibration due dates appearing on the Certificate of Calibration and label are determined by the client for administrative purposes and do not imply continued conformance to specification.

Deborah J. Nazimiec, Technical Manager

Edvaldo Calvao, President

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✓ In Tolerance ✗ Out of Tolerance

Calibration Data

Range	Nominal	As Found		As Left		Min	Max
Indication at Known Temp.							
Temp °F	32.0	32.10	✓	Left as Found	■	31	33
	60.0	60.10	✓	Left as Found	■	59	61
	100.0	100.10	✓	Left as Found	■	99	101

End of Datasheet

Calibration Standards

NIST Traceable #	Instrument ID#	Description	Model	Calibration Date	Date Due
1000354059	25080	Thermometer Indicator	1502A	09 APR 2014	31 OCT 2014
1000356954	05618	Platinum Resistance Thermometer	5618	10 JUN 2014	30 JUN 2015

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Certificate of Calibration

1000359109

Customer Information

Daniel Measurement & Control, Inc.
11100 Brittmoore Park Drive
Houston, TX 77041

PO #: 4105023425

Account #: DA1398
SO #: 107676

Instrument Identification

Instrument Id: **21460126**

Noun: Thermometer,Digital
Serial #: 21460126
Mfr: Fluke
Model: 51 Series II
Accuracy: ± (0.05% of Reading +0.3°C) or ± (0.05% of Reading +0.5°F)
Expanded Measurement Uncertainty at K=2: ± 0.1°C to 999.9°C. ± 0.4°C above 999.9°C

Certification Information

Reason For Service: Calibration
Technician: Stan Ezell
Type Of Calibration: Accredited
Cal Date: 16 JUL 14
As Found Condition: In Tolerance
Cal Due: 16 JUL 15
As Left Condition: Left As Found
Temperature: 24.0 °C
Procedure: 33K5-4-561-1 : Thermometer 51/53 Series II Rev0,03/01
Humidity: 41.0 %
Technician Remarks: Per Daniel Measurement and Control Specification Number: S-01919.
Quality Remarks: Calibration complies with ISO/IEC 17025:2005 & ANSI/NCSL Z540-1-1994 requirements.

This instrument has been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology, derived from natural physical constants, derived from ratio measurements, or compared to consensus standards.

Reported uncertainties and/or test uncertainty ratios (TUR's) are expressed as expanded uncertainty values at approximately the 95% confidence level using a coverage factor of K=2.

Statements of compliance, where applicable, are based on test results falling within specified limits with no reduction by the uncertainty of the measurement.

Certified Measurements, Inc.'s Quality System complies with the applicable requirements of ANSI/NCSL Z540-1 and ISO/IEC 17025.

The results contained herein relate only to the item calibrated. Calibration due dates appearing on the Certificate of Calibration and label are determined by the client for administrative purposes and do not imply continued conformance to specification.

This certificate shall not be reproduced except in full, without the written permission of Certified Measurements, Inc.

Deborah J. Nazimiec

Deborah J. Nazimiec, Technical Manager

Edvaldo Calvao, President

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Calibration Data

✓ In Tolerance ✗ Out of Tolerance

Range	Nominal	As Found		As Left		Min	Max
Temperature in °C ("K" T/C)							
" K " @ -3.554 mV	-100 °C	-100.0	✓	Left as Found	■	-100.4	-99.6
0.000 mV	0.0 °C	0.0	✓	Left as Found	■	-0.3	0.3
0.000 mV	32.0 °F	31.9	✓	Left as Found	■	31.5	32.5
0.000 mV	273.15 °K	273.1	✓	Left as Found	■	272.8	273.6
4.096 mV	100 °C	100.0	✓	Left as Found	■	99.6	100.4
8.138 mV	200 °C	200.0	✓	Left as Found	■	199.6	200.4
16.397 mV	400 °C	400.0	✓	Left as Found	■	399.5	400.5
24.905 mV	600 °C	600.0	✓	Left as Found	■	599.4	600.6
33.275 mV	800 °C	800.0	✓	Left as Found	■	799.3	800.7
41.276 mV	1000 °C	1000	✓	Left as Found	■	999.2	1001
52.410 mV	1300 °C	1300	✓	Left as Found	■	1299	1301
" J " TC @ 0.000 mV	0.0 °C	0.0	✓	Left as Found	■	-0.3	0.3
" T " TC @ 0.000 mV	0.0 °C	0.0	✓	Left as Found	■	-0.3	0.3
" E " TC @ 0.000 mV	0.0 °C	0.0	✓	Left as Found	■	-0.3	0.3
System with Probe Accy.							
Temp Indication °F	32.0	32.1	✓	Left as Found	■	30.2	33.8
°C	0.0	0.1	✓	Left as Found	■	-1.0	1.0
°C	100.0	100.2	✓	Left as Found	■	99.0	101.0

End of Datasheet

Calibration Standards

NIST Traceable #	Instrument ID#	Description	Model	Calibration Date	Date Due
1000340030	27606	Platinum Resistance Thermometer	12001-A-12-6-0-A	15 AUG 2013	31 AUG 2014
1000343605	34859	Calibrator, Multi-Product	5500A/SC600	03 OCT 2013	31 OCT 2014
1000347426	27607	Platinum Resistance Thermometer	12001-A-18-10-0-0	06 DEC 2013	31 DEC 2014
1000354050	01590	1 ppm Super Thermometer	1590	23 APR 2014	31 OCT 2014
1000356963	17112	Ice Point Dry-well	9101	27 JUN 2014	31 DEC 2014

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Certificate of Calibration

1000387275

Customer Information

Daniel Measurement & Control, Inc.
11100 Brittmoore Park Drive
Houston, TX 77041

PO #: 4105045648

Account #: DA1398
SO #: 116215

Instrument Identification

Instrument Id: **29908397/1**

Noun: Pressure Gage
Serial #: 29908397/1
Mfr: Stewarts
Model: 0-60 PSI Grade 3A
Accuracy: ± 0.25% of Span
Expanded Measurement Uncertainty at K=2: ± 0.03 PSI

Certification Information

Reason For Service: Calibration
Type Of Calibration: Accredited
As Found Condition: In Tolerance
As Left Condition: Left As Found
Procedure: 33K6-4-427-1 : Pressure Gages Rev 0, 30 Jun 11
Technician Remarks: Per Daniel Meas. & Control specification # S-01922.
Quality Remarks: Calibration complies with ISO/IEC 17025:2005 & ANSI/NCSL Z540-1-1994 requirements.

Technician: Harry Brown
Cal Date: 03 FEB 16
Cal Due: 03 FEB 17
Temperature: 21.6 °C
Humidity: 46.9 %

This instrument has been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology, derived from natural physical constants, derived from ratio measurements, or compared to consensus standards.

Reported uncertainties and/or test uncertainty ratios(TUR's) are expressed as expanded uncertainty values at approximately the 95% confidence level using a coverage factor of K=2.

Statements of compliance, where applicable, are based on test results falling within specified limits with no reduction by the uncertainty of the measurement.

Certified Measurements, Inc.'s Quality System complies with the applicable requirements of ANSI/NCSL Z540-1 and ISO/IEC 17025.

The results contained herein relate only to the item calibrated. Calibration due dates appearing on the Certificate of Calibration and label are determined by the client for administrative purposes and do not imply continued conformance to specification.

Deborah J. Nazimiec, Technical Manager

Edvaldo Calvao, President

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✓ In Tolerance ✗ Out of Tolerance

Calibration Data

Range	Nominal	As Found		As Left		Min	Max
Indication at Known Pressure							
Units		PSI	■	-	■	---	---
Applied	6.00	5.99	✓	Left as Found	■	5.85	6.15
	12.00	12.00	✓	Left as Found	■	11.85	12.15
	18.00	18.02	✓	Left as Found	■	17.85	18.15
	24.00	24.02	✓	Left as Found	■	23.85	24.15
	30.00	29.96	✓	Left as Found	■	29.85	30.15
	36.00	35.93	✓	Left as Found	■	35.85	36.15
	42.00	41.88	✓	Left as Found	■	41.85	42.15
	48.00	47.94	✓	Left as Found	■	47.85	48.15
	54.00	53.99	✓	Left as Found	■	53.85	54.15
	57.00	57.05	✓	Left as Found	■	56.85	57.15

End of Datasheet

Calibration Standards

NIST Traceable #	Instrument ID#	Description	Model	Calibration Date	Date Due
1000379338	29977	Thermohygrometer,Digital	RH30	04 SEP 2015	30 SEP 2016
1000385826	27438	Precision Pressure Controller/Calibrator	DPI510	06 JAN 2016	31 JAN 2017

Maintenance Action

Maintenance Date: 03 FEB 16

Technician: Harry Brown

Labor Expended :	0.00
Additional Labor Required :	0.00
Total Labor (hours):	**0.00**

Instrument Defect

Pointer off zero, bent in multiple locations, showing signs of tampering.

Action Required

Partial disassembly to remove pointer, straighten and reset zero position before calibration.

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