GW Allen Prover Inspection and Test Certification Package – GWP04

Updated: 2/17/2025

Gage Western Prover Inspection and Test Certification Package - GWP04

Updated:	2/17/2025
Prover Name:	GW_FMD_025_02_P
Certification Date:	11/20/2024
Certification Due:	11/20/2027
Serial Number:	000737
Date of Fabrication:	11/2018
Max Working Pressure:	285 PSIG
Nominal Flow Rate:	2,500 GPM

Package Contents:

CoastalFlow™
by Quorum Software

Report#: 737_11202024_PORTABLE FMD25 BACKUP 20gal
Issue Date: 11/20/2024 11:16 AM

Prover Calibration Report

Company Information

Customer:	GAGE WESTERN	Purchase Order #.:	1
Address:	7907 W INDUSTRIAL AVE MIDLAND TX 79706	Work Order #:	WO-24-60650
Owner:	GAGE WESTERN	Calibrated Volume:	20 GALLON BACK UP

Equipment Information

Manufacturer:	FMD	Calibration Date:	11/20/2024	
Model #:	#44025(IT)1AASGAAWCS	Due Date:	11/20/2027	
Description:	SVP	Temperature:	67	°F
Serial #:	737	Humidity:	62	% RH
ID #:	0	Barametric Pressure:	30.240	inHg
Tube Wall Thickness:	0.9655 inches	Technician:	ZACKARY CURRIE	
Tube Inside Diameter:	16.997 inches	Procedure Used:	API 4.9.4	
		Calibration Location:	CFLM LAB	
Conditions Statement	USED, GOOD CONDITON			

This instrument listed on this certificate has been calibrated against standards traceable thru National Institute of Standards and Technology (NIST), to the International System of Units (SI). Coastal Flow Liquid Measurement's quality system complies with applicable requirements of ISO/IEC 17025:2017. The reported uncertainties and/or "test uncertainties ratios" (TUR's) are expressed as expanded uncertainty values at approximately the 95% confidence level using a coverage factor of K=2. Statement of compliance, where applicable, are based on test results falling within specified limits with the uncertainty of the measurement taken into account. All results contained herein relate only to items(s) calibrated. This certificate shall not be reproduced except in full, without the written permission of Coastal Flow Liquid Measurement.

Data Results

Volume of 75.7216 Liters at 60 F & 0 PSIG
Volume of 20.0035 U.S. Gallons at 60 F & 0 PSIG
Volume of 0.476274 Barrels (42 Gal) at 60 F & 0 PSIG

Customer Satisfaction Survey

Authorized By: Shannon Thomas, Waterdraw Supervisor
Coastal Flow Liquid Measurement, Inc.

22210 McCleskey Rd.
New Caney, Texas 77357

CoastalFlow
by Quorum Software
Gravimetric Calibration Method
Calculations
11/20/2024

Customer:	GAGE WESTERN	Prover Manufacturer:	FMD
Work Order #:	WO-24-60690	Model #:	H44025(TT)1AASGAAWCS
Service Location:	CFLM LAB	Serial #:	737
Elevation:	110	Flow Tube Material:	304 Stainless
Standard Temperature (°F):	60.0	Detector Bar Material:	304 Stainless
Standard Pressure (psig):	0.0	Area Thermal Expansion Coefficient (Ga):	1.92E-05
Reference Weight Density (gm/cc):	8.00	Detector Thermal Expansion Coefficient (Gl):	9.60E-06
Field Test Weight Density (gm/cc):	7.84	Modulus of Elasticity (flow tube) (E):	2.80E+07
Compressibility factor:	3.20E-06	Flow Tube Inside Diameter (inches) (ID):	16.997
		Flow Tube Wall Thickness (inches) (WT):	0.966

	Run 1	Run 2	Run 3	Run 4	Run 5
Flow Rate (GPM)	17.643	13.950	18.457	14.282	18.177
Acquired Data					
Expected Mass of Water (Ww) (gm)	75496.6	75498.8	75499.0	75499.2	75498.4
Air Temperature (°F)	66.3	66.5	66.9	66.9	67.1
Detector Bar Temperature (Td) (°F)	63.6	63.7	63.8	63.9	63.9
Prover Temperature (Tp) (°F)	71.8	71.9	72.0	72.0	72.1
Prover pressure (Pp) (psig)	30.0	30.0	30.0	30.0	30.0
Water Electrical Conductivity (µS)	11.0	11.0	11.0	11.0	11.0
Calculated Densities					
Density of Air (p_a) (gm/cc)	0.001204	0.001204	0.001203	0.001203	0.001202
Density of Distilled Water (p_{tf}) (gm/cc)	0.997747	0.997734	0.997721	0.997721	0.997708
Density of VSMOW (gm/cc)	N/A	N/A	N/A	N/A	N/A
K value of VSMOW (µS/cm)	N/A	N/A	N/A	N/A	N/A
Density of Water in container (g/cm3)	0.997747	0.997734	0.997721	0.997721	0.997708
Volume Calculation					
Correction for Buoyancy of Weights (CBW)	1.001057	1.001058	1.001057	1.001057	1.001056
Corrected Mass of Water (Mw) (gm)	75576.400	75578.678	75578.802	75579.003	75578.126
Volume of Water (Vw) (ml)	75747.058	75750.328	75751.440	75751.641	75751.749
Factors for Correction to Standard Conditions					
Effect of Temp on Flow Tube Steel (CTS)	1.000261	1.000264	1.000267	1.000268	1.000270
Effect of Press. On Flow Tube (CPSp)	1.000019	1.000019	1.000019	1.000019	1.000019
Effect of Press. on Water (CPLp)	1.000096	1.000096	1.000096	1.000096	1.000096
Temp. correction CTS for SVP (CTSp)	0.999739	0.999736	0.999733	0.999732	0.999730
WD Volume Corrected for CTSp	75727.288	75730.330	75731.214	75731.340	75731.296
WD value for single cal. Corrected CPSp, CPLp	75718.580	75721.622	75722.506	75722.632	75722.588
Calibrated Prover Volume per Run, (CPV)	75718.580	75721.622	75722.506	75722.632	75722.588
Calculated Deviation from Average Volume	-0.0040%	0.0000%	0.0012%	0.0014%	0.0013%

Repeatability: 0.005%

Environment Details

Humidity:	62.0	% rh
Barametric Pressure:	30.2	in. Hg
Ambient Temperature:	67.0	°F

Notes:

NEW SEALS BEFORE WD

Base Prover Vol.:			Expanded Uncertainty by Unit of Measure
75721.586	ml	9.32	
75.7216	liters	0.01	
0.0757216	cubic meters	0.00	
20.0035	gallons	0.00	
4620.8147	cubic inches	0.57	
0.476274	barrels	0.00	

Previous Calibration Date:	1/0/00		
Previous Volume:	19.99514	gallons	0.01% Expanded Uncertainty expressed as Percentage
% Change in BPV:	0.042	%	

Performed By: ZACKARY CURRIE For: Coastal Flow Liquid Msmt. Date: 11/20/2024

Witness: _____ For: GAGE WESTERN Date: 11/20/2024

Witness: _____ For: _____ Date: 11/20/2024

Coastal Flow Liquid Measurement 22210 McCleskey Rd. New Caney, TX 77357 713-477-1956

CoastalFlow
by Quorum Software
Gravimetric Calibration Method
Equipment Traceability Report
11/20/2024

Customer:	GAGE WESTERN	Prover Model #:	[illegible]
Report #:	WO-24-60890	Prover Serial #:	737
Scale Serial #:	43566166	Nominal Volume (gal):	19.9451
Scale Range (kg):	0 - 300 Kg	Container Mass (kg):	35.000
		Expected Mass (kg):	75.650
		Target Mass (kg):	68.552 to 132.828

Test Weights

Serial #	Cert. Date	Nominal Mass	As Left Mass	Aggregate Mass
43360		100.0 kg	-0.001004 kg	99.9990 kg
			Total Aggregate Mass:	99.9990 kg

Verification	Target Mass (kg)	Scale Indication (kg)	Zero (kg)	Difference (kg)	Allowable Diff (kg)
Test 1	100.0000	100.0000	0.0004	0.0000	0.0050
Test 2	100.0000	99.9998	0.0004	0.0002	0.0050
Test 3	100.0000	100.0004	0.0000	-0.0004	0.0050

Equipment	Serial #	Range	Calibration Date	Traceability #	Asset ID
Temperature	4S6095	0-120 F	11/13/2024	92789	4S6095
Pressure	574807	0-100 PSI	8/6/2024	92789	574807
Scale 1	43566166	0 - 300 Kg	2/14/2023	C04L	43566166
Scale 2	N/A	N/A	N/A	N/A	N/A
Water Conductivity	574506	0-10000 Ms	8/11/2022	ND006067	574506
Barometer	240348813	400 - 1070 mbh/hPa	8/26/2024	400-14169058	230588623

Performed By: _____ For: Coastal Flow Liquid Msmt. Date: 11/20/2024
ZACKARY CURRIE

Witness: _____ For: GAGE WESTERN Date: 11/20/2024

Witness: _____ For: _____ Date: 11/20/2024

CoastalFlow
by Quorum Software

Gravimetric Calibration Method
Data Collection
11/20/2024

Customer Name: GAGE WESTERN
Service Location: CFLM LAB
Work Order No: WO-24-60690

Elevation: 110 ft
Relative Humidity: 62 % rh
Barometric Pressure: 30.24 in. Hg
Ambient Temperature: 67 °F

Manufacturer: FMD
Prover Type: SVP
Model No: H44025(TT)1AASGAAWCS
Serial No: 737
Flow Tube Material: 304 SS
Detector Bar Material: 304 SS
Flow Tube Wall Thickness (WT): 0.9655 in
Flow Tube Inside Diameter (ID): 16.997 in
Previous Volume: 19.99514 gal
Date: 12/6/2021

	Run 1	Run 2	Run 3	Run 4	Run 5
Run Time (sec)	68	86	65	84	66
Acquired Data					
Scale #1 Mass of Water (Ww) (g)	75496.6	75498.8	75499.0	75499.2	75498.4
Scale #2 Mass of Water (Ww) (g)					
Scale #3 Mass of Water (Ww) (g)					
Scale #4 Mass of Water (Ww) (g)					
Total Mass of Water (Ww) (g)					
Air Temperature (°F)	66.3	66.5	66.9	66.9	67.1
Detector Bar Temperature (Td) (°F)	63.6	63.7	63.8	63.9	63.9
Prover Temperature (Tp) (°F)	71.8	71.9	72.0	72.0	72.1
Prover pressure (Pp) (psig)	30	30	30	30	30
Water Electrical Conductivity (µS)	11	11	11	11	11

Scale #1

Zero in Kg	Target Mass in Kg	Scale Indication in Kg
.0004		100.0000
.0004		99.9998
.0000		100.0004

Scale #2

Zero in Kg	Target Mass in Kg	Scale Indication in Kg

Performed By: ZACKARY CURRIE For: Coastal Flow Liquid Msmt. Date: 11/20/2024

Witnessed By: For: GAGE WESTERN Date: 11/20/2024

Witnessed By: For: Date: 11/20/2024

Comments: New Seals Before WD

Coastal Flow Liquid Measurement 22210 McCleskey Rd New Caney, TX 77357 713-477-1956

CoastalFlow
by Quorum Software

Report#: 737_11202024_PORTABLE FMD25 15gal
Issue Date: 11/20/2024 11:30 AM

Prover Calibration Report

Company Information

Customer:	GAGE WESTERN	Purchase Order #.:	1
Address:	7907 W INDUSTRIAL AVE MIDLAND TX 79706	Work Order #:	WO-24-60990
Owner:	GAGE WESTERN	Calibrated Volume:	15 GALLON

Equipment Information

Manufacturer:	FMD	Calibration Date:	11/20/2024	
Model #:	H4025(TT)LAASGAAAMCS	Due Date:	11/20/2027	
Description:	SVP	Temperature:	64	°F
Serial #:	737	Humidity:	62	% RH
ID #:	0	Barametric Pressure:	30.240	inHg
Tube Wall Thickness:	0.9655 inches	Technician:	ZACKARY CURRIE	
Tube Inside Diameter:	16.997 inches	Procedure Used:	API 4.9.4	
		Calibration Location:	CFLM LAB	

Conditions Statement: USED, GOOD CONDITION

This instrument listed on this certificate has been calibrated against standards traceable thru National Institute of Standards and Technology (NIST), to the International System of Units (SI). Coastal Flow Liquid Measurement's quality system complies with applicable requirements of ISO/IEC 17025:2017. The reported uncertainties and or "test uncertainties ratios" (TUR's) are expressed as expanded uncertainty values at approximately the 95% confidence level using a coverage factor of K=2. Statement of compliance, where applicable, are based on test results falling within specified limits with the uncertainty of the measurement taken into account. All results contained herein relate only to items(s) calibrated. This certificate shall not be reproduced except in full, without the written permission of Coastal Flow Liquid Measurement.

Data Results

Volume of 56.8054 Liters at 60 F & 0 PSIG
Volume of 15.0064 U.S. Gallons at 60 F & 0 PSIG
Volume of 0.357295 Barrels (42 Gal) at 60 F & 0 PSIG

Customer Satisfaction Survey

Authorized By: Shannon Thomas, Waterdraw Supervisor
Coastal Flow Liquid Measurement, Inc.

22210 McCleskey Rd.
New Caney, Texas 77357

CoastalFlow
by Quorum Software
Gravimetric Calibration Method
Calculations
11/20/2024

Customer:	GAGE WESTERN	Prover Manufacturer:	FMD
Work Order #:	WO-24-60690	Model #:	H44025(TT)1AASGAAWCS
Service Location:	CFLM LAB	Serial #:	737
Elevation:	110	Flow Tube Material:	304 Stainless
Standard Temperature (°F):	60.0	Detector Bar Material:	304 Stainless
Standard Pressure (psig):	0.0	Area Thermal Expansion Coefficient (Ga):	1.92E-05
Reference Weight Density (gm/cc):	8.00	Detector Thermal Expansion Coefficient (Gl):	9.60E-06
Field Test Weight Density (gm/cc):	7.84	Modulus of Elasticity (flow tube) (E):	2.80E+07
Compressibility factor:	3.20E-06	Flow Tube Inside Diameter (inches) (ID):	16.997
		Flow Tube Wall Thickness (inches) (WT):	0.966

	Run 1	Run 2	Run 3	Run 4	Run 5
Flow Rate (GPM)	25.008	14.290	20.937	13.437	21.958
Acquired Data					
Expected Mass of Water (Ww) (gm)	56639.0	56640.8	56641.4	56643.2	56640.8
Air Temperature (°F)	63.3	63.6	63.7	63.9	64.2
Detector Bar Temperature (Td) (°F)	62.5	62.4	62.3	62.3	62.4
Prover Temperature (Tp) (°F)	71.2	71.2	71.3	71.3	71.4
Prover pressure (Pp) (psig)	30.0	30.0	30.0	30.0	30.0
Water Electrical Conductivity (µS)	11.0	11.0	11.0	11.0	11.0
Calculated Densities					
Density of Air (ρ_a) (gm/cc)	0.001211	0.001210	0.001210	0.001210	0.001209
Density of Distilled Water (ρ_{st}) (gm/cc)	0.997822	0.997822	0.997810	0.997810	0.997797
Density of VSMOW (gm/cc)	N/A	N/A	N/A	N/A	N/A
K value of VSMOW (µS/cm)	N/A	N/A	N/A	N/A	N/A
Density of Water in container (g/cm3)	0.997822	0.997822	0.997810	0.997810	0.997797
Volume Calculation					
Correction for Buoyancy of Weights (CBW)	1.001064	1.001063	1.001063	1.001063	1.001062
Corrected Mass of Water (Mw) (gm)	56699.264	56701.009	56701.610	56703.412	56700.953
Volume of Water (Vw) (ml)	56823.025	56824.773	56826.059	56827.865	56826.141
Factors for Correction to Standard Conditions					
Effect of Temp on Flow Tube Steel (CTS)	1.000239	1.000238	1.000239	1.000239	1.000242
Effect of Press. On Flow Tube (CPSp)	1.000019	1.000019	1.000019	1.000019	1.000019
Effect of Press. on Water (CPLp)	1.000096	1.000096	1.000096	1.000096	1.000096
Temp. correction CTS for SVP (CTSp)	0.999761	0.999762	0.999761	0.999761	0.999758
WD Volume Corrected for CTSp	56809.444	56811.249	56812.478	56814.283	56812.389
WD value for single cal. Corrected CPSp, CPLp	56802.912	56804.716	56805.945	56807.750	56805.856
Calibrated Prover Volume per Run, (CPV)	56802.912	56804.716	56805.945	56807.750	56805.856
Calculated Deviation from Average Volume	-0.0044%	-0.0013%	0.0009%	0.0041%	0.0007%

Repeatability: 0.009%

Environment Details

Humidity:	62.0	% rh
Barametric Pressure:	30.2	in. Hg
Ambient Temperature:	64.0	°F

Notes:

NEW SEALS BEFORE WD,
V2 SWITCH PREVIOUSLY CHANGED

Base Prover Vol.:			Expanded Uncertainty by Unit of Measure
56805.436	ml	8.89	
56.8054	liters	0.01	
0.0568054	cubic meters	0.00	
15.0064	gallons	0.00	
3466.4804	cubic inches	0.54	
0.357295	barrels	0.00	

Previous Calibration Date:	1/0/00		
Previous Volume:	15.00467	gallons	0.02% Expanded Uncertainty expressed as Percentage
% Change in BPV:	0.012	%	

Performed By: ZACKARY CURRIE For: Coastal Flow Liquid Msmt. Date: 11/20/2024

Witness: _____ For: GAGE WESTERN Date: 11/20/2024

Witness: _____ For: _____ Date: 11/20/2024

Coastal Flow Liquid Measurement 22210 McCleskey Rd. New Caney, TX 77357 713-477-1956

CoastalFlow
by Quorum Software
Gravimetric Calibration Method
Equipment Traceability Report
11/20/2024

Customer:	GAGE WESTERN	Prover Model #:	[illegible]
Report #:	WO-24-60190	Prover Serial #:	737
Scale Serial #:	43566166	Nominal Volume (gal):	15.0047
Scale Range (kg):	0 - 300 Kg	Container Mass (kg):	35.000
		Expected Mass (kg):	56.799
		Target Mass (kg):	73.439 to 110.159

Test Weights

Serial #	Cert. Date	Nominal Mass	As Left Mass	Aggregate Mass
43360		100.0 kg	-0.001004 kg	99.9990 kg
			Total Aggregate Mass:	99.9990 kg

Verification	Target Mass (kg)	Scale Indication (kg)	Zero (kg)	Difference (kg)	Allowable Diff (kg)
Test 1	100.0000	100.0000	0.0004	0.0000	0.0050
Test 2	100.0000	99.9998	0.0004	0.0002	0.0050
Test 3	100.0000	100.0004	0.0000	-0.0004	0.0050

Equipment	Serial #	Range	Calibration Date	Traceability #	Asset ID
Temperature	4S6095	0-120 F	11/13/2024	92789	4S6095
Pressure	574807	0-100 PSI	8/6/2024	92789	574807
Scale 1	43566166	0 - 300 Kg	2/14/2023	C04L	43566166
Scale 2	N/A	N/A	N/A	N/A	N/A
Water Conductivity	574506	0-10000 Ms	8/11/2022	ND006067	574506
Barometer	240348813	400 - 1070 mbh/hPa	8/26/2024	400-14169058	230588623

Performed By: _____ For: Coastal Flow Liquid Msmt. Date: 11/20/2024
ZACKARY CURRIE

Witness: _____ For: GAGE WESTERN Date: 11/20/2024

Witness: _____ For: _____ Date: 11/20/2024

Coastal Flow Liquid Measurement 22210 McCleskey Rd. New Caney TX 77357 713-477-1956

CoastalFlow
by Quorum Software
Gravimetric Calibration Method
Data Collection
11/20/2024

Customer Name: GAGE WESTERN
Service Location: CFLM LAB
Work Order No: WO-24-60690

Elevation: 110 ft
Relative Humidity: 62 % rh
Barometric Pressure: 30.24 in. Hg
Ambient Temperature: 64 °F

Manufacturer: FMD
Prover Type: SVP
Model No: H44025(TT)1AASGAAWCS
Serial No: 737
Flow Tube Material: 304 SS
Detector Bar Material: 304 SS
Flow Tube Wall Thickness (WT): 0.9655 in
Flow Tube Inside Diameter (ID): 16.997 in
Previous Volume: 15.00467 gal
Date: 12/6/2021

	Run 1	Run 2	Run 3	Run 4	Run 5
Run Time (sec)	36	63	43	62	41
Acquired Data					
Scale #1 Mass of Water (Ww) (g)	56639.0	56640.8	56641.4	56643.2	56640.8
Scale #2 Mass of Water (Ww) (g)					
Scale #3 Mass of Water (Ww) (g)					
Scale #4 Mass of Water (Ww) (g)					
Total Mass of Water (Ww) (g)					
Air Temperature (°F)	63.3	63.6	63.7	63.9	64.2
Detector Bar Temperature (Td) (°F)	62.5	62.4	62.3	62.3	62.4
Prover Temperature (Tp) (°F)	71.2	71.2	71.3	71.3	71.4
Prover pressure (Pp) (psig)	30	30	30	30	30
Water Electrical Conductivity (µS)	11	11	11	11	11

Scale #1

Zero in Kg	Target Mass in Kg	Scale Indication in Kg
.0004	100.0	100.0000
.0004	100.0	99.9998
.0000	100.0	100.0004

Scale #2

Zero in Kg	Target Mass in Kg	Scale Indication in Kg

Performed By: ZACKARY CURRIE For: Coastal Flow Liquid Msmt. Date: 11/20/2024

Witnessed By: For: GAGE WESTERN Date: 11/20/2024

Witnessed By: For: Date: 11/20/2024

Comments: New Seals Before WD, V8 Switch Previously Changed

CoastalFlow
by Quorum Software

Report#: 737_11202024_PORTABLE FMD25 5gal
Issue Date: 11/20/2024 11:37 AM

Prover Calibration Report

Company Information

Customer:	GAGE WESTERN	Purchase Order #.:	1
Address:	7907 W INDUSTRIAL AVE MIDLAND TX 79706	Work Order #:	WO-24-60650
Owner:	GAGE WESTERN	Calibrated Volume:	5 GALLON

Equipment Information

Manufacturer:	FMD	Calibration Date:	11/20/2024	
Model #:	H4402S(TT)1AAAGAAWCS	Due Date:	11/20/2027	
Description:	SVP	Temperature:	66	°F
Serial #:	737	Humidity:	62	% RH
ID #:	0	Barametric Pressure:	30.240	inHg
Tube Wall Thickness:	0.9655 inches	Technician:	ZACKARY CURRIE	
Tube Inside Diameter:	16.957 inches	Procedure Used:	API 4.9.4	
		Calibration Location:	CRUM LAB	
Conditions Statement	USED, GOOD CONDITION			

This instrument listed on this certificate has been calibrated against standards traceable thru National Institute of Standards and Technology (NIST), to the International System of Units (SI). Coastal Flow Liquid Measurement's quality system complies with applicable requirements of ISO/IEC 17025:2017. The reported uncertainties and/or "test uncertainties ratios" (TUR's) are expressed as expanded uncertainty values at approximately the 95% confidence level using a coverage factor of K=2. Statement of compliance, where applicable, are based on test results falling within specified limits with the uncertainty of the measurement taken into account. All results contained herein relate only to items(s) calibrated. This certificate shall not be reproduced except in full, without the written permission of Coastal Flow Liquid Measurement.

Data Results

Volume of 18.9148 Liters at 60 F & 0 PSIG
Volume of 4.99676 U.S. Gallons at 60 F & 0 PSIG
Volume of 0.118970 Barrels (42 Gal) at 60 F & 0 PSIG

Customer Satisfaction Survey

Authorized By: Shannon Thomas, Waterdraw Supervisor
Coastal Flow Liquid Measurement, Inc.

22210 McCleskey Rd.
New Caney, Texas 77357

CoastalFlow
by Quorum Software
Gravimetric Calibration Method
Calculations
11/20/2024

Customer:	GAGE WESTERN	Prover Manufacturer:	FMD
Work Order #:	WO-24-60690	Model #:	H44025(TT)1AASGAAWCS
Service Location:	CFLM LAB	Serial #:	737
Elevation:	110	Flow Tube Material:	304 Stainless
Standard Temperature (°F):	60.0	Detector Bar Material:	304 Stainless
Standard Pressure (psig):	0.0	Area Thermal Expansion Coefficient (Ga):	1.92E-05
Reference Weight Density (gm/cc):	8.00	Detector Thermal Expansion Coefficient (Gl):	9.60E-06
Field Test Weight Density (gm/cc):	7.84	Modulus of Elasticity (flow tube) (E):	2.80E+07
Compressibility factor:	3.20E-06	Flow Tube Inside Diameter (inches) (ID):	16.997
		Flow Tube Wall Thickness (inches) (WT):	0.966

	Run 1	Run 2	Run 3	Run 4	Run 5
Flow Rate (GPM)	11.090	8.555	12.476	7.880	11.516
Acquired Data					
Expected Mass of Water (Ww) (gm)	18859.2	18859.4	18860.0	18859.6	18859.0
Air Temperature (°F)	65.1	65.3	65.6	65.7	65.8
Detector Bar Temperature (Td) (°F)	62.9	63.0	63.1	63.2	63.3
Prover Temperature (Tp) (°F)	71.6	71.6	71.7	71.7	71.8
Prover pressure (Pp) (psig)	30.0	30.0	30.0	30.0	30.0
Water Electrical Conductivity (µS)	11.0	11.0	11.0	11.0	11.0
Calculated Densities					
Density of Air (ρ_a) (gm/cc)	0.001207	0.001206	0.001206	0.001206	0.001205
Density of Distilled Water (ρ_w) (gm/cc)	0.997772	0.997772	0.997759	0.997759	0.997747
Density of VSMOW (gm/cc)	N/A	N/A	N/A	N/A	N/A
K value of VSMOW (µS/cm)	N/A	N/A	N/A	N/A	N/A
Density of Water in container (g/cm3)	0.997772	0.997772	0.997759	0.997759	0.997747
Volume Calculation					
Correction for Buoyancy of Weights (CBW)	1.001060	1.001059	1.001059	1.001059	1.001058
Corrected Mass of Water (Mw) (gm)	18879.191	18879.372	18879.973	18879.572	18878.953
Volume of Water (Vw) (ml)	18921.348	18921.529	18922.378	18921.976	18921.583
Factors for Correction to Standard Conditions					
Effect of Temp on Flow Tube Steel (CTS)	1.000251	1.000252	1.000254	1.000255	1.000258
Effect of Press. On Flow Tube (CPSp)	1.000019	1.000019	1.000019	1.000019	1.000019
Effect of Press. on Water (CPLp)	1.000096	1.000096	1.000096	1.000096	1.000096
Temp. correction CTS for SVP (CTSp)	0.999749	0.999748	0.999746	0.999745	0.999742
WD Volume Corrected for CTSp	18916.599	18916.761	18917.572	18917.151	18916.701
WD value for single cal. Corrected CPSp, CPLp	18914.424	18914.586	18915.397	18914.976	18914.526
Calibrated Prover Volume per Run, (CPV)	18914.424	18914.586	18915.397	18914.976	18914.526
Calculated Deviation from Average Volume	-0.0019%	-0.0010%	0.0033%	0.0010%	-0.0014%

Repeatability: 0.005%

Environment Details

Humidity:	62.0	% rh
Barametric Pressure:	30.2	in. Hg
Ambient Temperature:	66.0	°F

Notes:

NEW SEALS BEFORE WD
V2 SWITCH PREVIOUSLY CHANGED

Base Prover Vol.:			Expanded Uncertainty by Unit of Measure
18914.782	ml	23.45	
18.9148	liters	0.02	
0.0189148	cubic meters	0.00	
4.99676	gallons	0.01	
1154.2508	cubic inches	1.43	
0.118970	barrels	0.00	

Previous Calibration Date:	1/0/00	0.12%	Expanded Uncertainty expressed as Percentage
Previous Volume:	4.99046 gallons		
% Change in BPV:	0.126 %		

Performed By: ZACKARY CURRIE For: Coastal Flow Liquid Msmt. Date: 11/20/2024

Witness: _____ For: GAGE WESTERN Date: 11/20/2024

Witness: _____ For: _____ Date: 11/20/2024

CoastalFlow
by Quorum Software
Gravimetric Calibration Method
Equipment Traceability Report
11/20/2024

Customer:	GAGE WESTERN	Prover Model #:	[illegible]		
Report #:	WO-24-60690	Prover Serial #:	737		
Scale Serial #:	43566166	Nominal Volume (gal):	4.9905		
Scale Range (kg):	0 - 300 Kg	Container Mass (kg):	35.000		
		Expected Mass (kg):	58.891		
		Target Mass (kg):	43.113	to	64.669

Test Weights

Serial #	Cert. Date	Nominal Mass	As Left Mass	Aggregate Mass
43362		50.0 kg	0.000546 kg	50.0005 kg
			Total Aggregate Mass:	50.0005 kg

Verification	Target Mass (kg)	Scale Indication (kg)	Zero (kg)	Difference (kg)	Allowable Diff. (kg)
Test 1	50.0000	50.0000	0.0006	0.0000	0.0025
Test 2	50.0000	50.0002	0.0000	-0.0002	0.0025
Test 3	50.0000	49.9998	0.0008	0.0002	0.0025

Equipment	Serial #	Range	Calibration Date	Traceability #	Asset ID
Temperature	4S6095	0-120 F	11/13/2024	92789	4S6095
Pressure	574807	0-100 PSI	8/6/2024	92789	574807
Scale 1	43566166	0 - 300 Kg	2/14/2023	C04L	43566166
Scale 2	N/A	N/A	N/A	N/A	N/A
Water Conductivity	574506	0-10000 Ms	8/11/2022	ND006067	574506
Barometer	240348813	400 - 1070 mbh/hPa	8/26/2024	400-14169058	230588623

Performed By: _____ For: Coastal Flow Liquid Msmt. Date: 11/20/2024
ZACKARY CURRIE

Witness: _____ For: GAGE WESTERN Date: 11/20/2024

Witness: _____ For: _____ Date: 11/20/2024

CoastalFlow
by Quorum Software
Gravimetric Calibration Method
Data Collection
11/20/2024

Customer Name: GAGE WESTERN
Service Location: CFLM LAB
Work Order No: WO-24-60690

Elevation: 110 ft
Relative Humidity: 62 % rh
Barometric Pressure: 30.24 in. Hg
Ambient Temperature: 66 °F

Manufacturer: FMD
Prover Type: SVP
Model No: H44025(TT)1AASGAAWCS
Serial No: 737
Flow Tube Material: 304 SS
Detector Bar Material: 304 SS
Flow Tube Wall Thickness (WT): 0.9655 in
Flow Tube Inside Diameter (ID): 16.997 in
Previous Volume: 4.99046 gal
Date: 12/6/2021

	Run 1	Run 2	Run 3	Run 4	Run 5
Run Time (sec)	27	35	24	38	26
Acquired Data					
Scale #1 Mass of Water (Ww) (g)	18859.2	18859.4	18860.0	18859.6	18859.0
Scale #2 Mass of Water (Ww) (g)					
Scale #3 Mass of Water (Ww) (g)					
Scale #4 Mass of Water (Ww) (g)					
Total Mass of Water (Ww) (g)					
Air Temperature (°F)	65.1	65.3	65.6	65.7	65.8
Detector Bar Temperature (Td) (°F)	62.9	63.0	63.1	63.2	63.3
Prover Temperature (Tp) (°F)	71.6	71.6	71.7	71.7	71.8
Prover pressure (Pp) (psig)	30	30	30	30	30
Water Electrical Conductivity (µS)	11	11	11	11	11

Scale #1

Zero in Kg	Target Mass in Kg	Scale Indication in Kg
.0006	50	50.0000
.0000	50	50.0002
.0008	50	49.9998

Scale #2

Zero in Kg	Target Mass in Kg	Scale Indication in Kg

Performed By: ZACKARY CURRIE For: Coastal Flow Liquid Msmt. Date: 11/20/2024

Witnessed By: For: GAGE WESTERN Date: 11/20/2024

Witnessed By: For: Date: 11/20/2024

Comments: V2 Switch Had Been Changed Previously
New Seals Before WD

SO 4283-0101 PRESS TRANS

EMERSON

25 September, 2018

Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN 55379

Calibration Data Sheet Consistent with ISO 10474 3.1 or EN 10204 3.1

Customer Information

Name: FLOW MANAGEMENT DEVICES LLC
PO: 026932

Manufacturer Information

Sales Order: 5333246
Line: 1

Device Information

Device Type: Pressure Transmitter
Customer Ref/ID: 000-104178-SEN
Serial No: 0023974

Model No:3051S2TG4A2E11A2EKDM8Q4

Output: Linear
Device ID: 2188257

Calibration Information

Factory: Shakopee, MN, USA
Station Name: SHAK_PRESSURE_CALIBRATION_05
Operator ID: 35588
Calibration Date: 09/24/2018 07:12:09 PM

Internal Ref #: 40106988

Permanent Tag Information

Wire-On Tag Information

Equipment Used

EqNumber:	EqName:	CalDueDate:
E3-58706	Load Box	3/20/2019 8:20:00AM
E3-60784	Precision Resistance Decade	2/9/2019 6:44:00AM
P3-54297	Pressure Controller	11/4/2018 2:30:00PM
P3-54940	Pressure Controller	11/4/2018 3:05:00PM

SO 4283-0101 PRESS TRANS

Calibration Data

Range: 0.000 TO 4,000.000 PSI

Reference of Calibration: Gauge
Damping: 0.40 seconds

% of Range	Applied Pressure	Requested Applied Pressure	Analog Output (mA)	% Span Error	Pass/Fail
100.000	4000.000 PSI	4000.0000 PSI	20.00046	0.00288	PASS
80.000	3200.000 PSI	3200.0000 PSI	16.80108	0.00675	PASS
60.000	2400.000 PSI	2400.0000 PSI	13.59546	-0.02837	PASS
40.000	1600.000 PSI	1600.0000 PSI	10.39992	-0.00050	PASS
20.000	800.000 PSI	800.0000 PSI	7.20074	0.00463	PASS
0.000	0.000 PSI	0.0000 PSI	4.00064	0.00400	PASS

This is to certify that the listed product meets the applicable Rosemount Specifications. Measuring and test equipment used in the manufacture and inspection of the listed product are traceable to the National Institute of Standards and Technology. The calibration system was designed to meet the intent of ANSI Z540-1-1994.

Heather Matthiesen
Quality Manager

SO 4283 0101 TUBE TEMP

EMERSON

15 September, 2018

Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN 55379

Calibration Data Sheet Consistent with ISO 10474 3.1 or EN 10204 3.1

Customer Information

Name: FLOW MANAGEMENT DEVICES LLC
PO: 026716

Manufacturer Information

Sales Order: 5310382
Line: 1

Device Information

Device Type: Temperature Transmitter
Customer Ref/ID: 000-112012-SEN
Serial No: 0016073

Model No: 3144PD1A1KAM5T1C4Q4

Output: Linear

Calibration Information

Factory: SHAKOPEE, MN, USA
Station Name: SHAK_TE
Operator ID: 73330
Calibration Date: 09/10/2018 05:58:22 AM

Internal Ref #: 40101475

Permanent Tag Information

Wire-On Tag Information

Equipment Used

EqNumber:	EqName:	CalDueDate:
E3-60868	Multimeter	11/12/2018 11:06:00AM

18SHTC0016073_Q4-TEMP_RSK_1

SO 4283-0101 TUBE TEMP

Calibration Data

Sensor 1 **Pt100 00385** **4 Wire** **-50.00 TO 150.00 DEG C**

% of Range	Measured Input	Digital Output	Analog Output	% Span Error	Pass/Fail
100.098	150.197 DEG C	150.201 DEG C	20.0161 mA	0.0021	PASS
75.094	100.188 DEG C	100.185 DEG C	16.0151 mA	0.0004	PASS
50.091	50.182 DEG C	50.176 DEG C	12.0138 mA	-0.0047	PASS
25.107	0.214 DEG C	0.213 DEG C	8.0175 mA	0.0024	PASS
0.084	-49.831 DEG C	-49.829 DEG C	4.0136 mA	0.0005	PASS

This is to certify that the listed product meets the applicable Rosemount Specifications. Measuring and test equipment used in the manufacture and inspection of the listed product are traceable to the National Institute of Standards and Technology. The calibration system was designed to meet the intent of ANSI Z540-1-1994.

Heather Matthiesen
Quality Manager

EMERSON

23 October, 2018

Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN 55379

Calibration Data Sheet Consistent with ISO 10474 3.1 or EN 10204 3.1

Customer Information

Name: FLOW MANAGEMENT DEVICES LLC
PO: 027350

Manufacturer Information

Sales Order: 5378405
Line: 1

Device Information

Device Type: Temperature Transmitter
Customer Ref/ID: 000-112012-SEN
Serial No: 0019539

Model No: 3144PD1A1KAM5T1C4Q4

Output: Linear

Calibration Information

Factory: SHAKOPEE, MN, USA
Station Name: SHAK_TE
Operator ID: 73432
Calibration Date: 10/23/2018 01:06:14 AM

Internal Ref #: 40119881

Permanent Tag Information

Wire-On Tag Information

Equipment Used

EqNumber:	EqName:	CalDueDate:
E3-60866	Multimeter	1/12/2019 7:46:00AM

SO 4283-0101 SWB TEMP

Calibration Data

Sensor 1 **Pt100 00385** **4 Wire** **-50.00 TO 150.00 DEG C**

% of Range	Measured Input	Digital Output	Analog Output	% Span Error	Pass/Fail
100.099	150.199 DEG C	150.200 DEG C	20.0161 mA	0.0011	PASS
75.103	100.205 DEG C	100.212 DEG C	16.0156 mA	-0.0050	PASS
50.092	50.185 DEG C	50.183 DEG C	12.0133 mA	-0.0094	PASS
25.104	0.208 DEG C	0.205 DEG C	8.0157 mA	-0.0059	PASS
0.088	-49.824 DEG C	-49.828 DEG C	4.0133 mA	-0.0049	PASS

This is to certify that the listed product meets the applicable Rosemount Specifications. Measuring and test equipment used in the manufacture and inspection of the listed product are traceable to the National Institute of Standards and Technology. The calibration system was designed to meet the intent of ANSI Z540-1-1994.

Heather Matthiesen
Quality Manager