



Gage Western Prover Inspection and Test Certification Package – P04

Updated: 12/9/2021



Gage Western Prover Inspection and Test Certification Package - GWP-04

Updated: 12/9/2021

Prover Name: GW_FMD_025_02_P

Certification Date: 12/06/2021

Certification Due: 12/06/2024

Serial Number: 000737

Date of Fabrication: 11/2018

Max Working Pressure: 285 PSIG

Nominal Flow Rate: 2,500 GPM

Package Contents:

1. Cover Sheet
2. Table of Contents
3. Primary Waterdraw
4. Secondary Waterdraw
5. Tertiary Waterdraw
6. Temperature Transmitter
7. Temperature Transmitter
8. Pressure Transmitter



**DISTRIBUTION
AND
SERVICE**

Gravimetric Waterdraw Certificate

Customer:	GAGE WESTERN, LLC	Job Number :	004283
Customer P.O. # :	N/A	Prover Serial Number :	000737
Description / Model Number :	H44025(TT)AASGAAWCS	Prover Tag Number:	N/A
Test Procedure :	API 4.9.4	PRIMARY VOLUME	
Test Date :	December 6, 2021		
Customer Address:	MIDLAND, TX		
Compressibility factor for water (°F/psig)	3.2E-06	Area Thermal Expansion Coefficient (Ga)	1.92E-05
Elevation (ft)	60	Detector Thermal Expansion Coefficient (GI)	9.60E-06
Standard Temperature (°F)	60.0	Modulus of Elasticity (flow tube) (E)	2.80E+07
Standard Pressure (psig)	0.0	Flow Tube Inside Diameter (inches) (ID)	16.997
Field Test Weight Density (gm/cc)	7.85	Flow Tube Wall Thickness (inches) (WT)	0.9655
Reference Test Weight density (gm/cc)	8.00	Conductivity Reading (uS)	15

Collected Data	Fill 1	Fill 2	Fill 3	Fill 4	Fill 5
Run Time (sec)	111	100	153	152	152
Apparent Mass of Water (Ww) (gm)	75424.8	75424.0	75425.2	75425.2	75424.8
Air Temperature (°F)	71.0	70.9	70.6	70.7	70.6
Detector Bar Temperature (Td) (°F)	75.1	75.2	75.2	75.3	75.3
Prover Temperature (Tp) (°F)	78.1	78.1	78.1	78.2	78.2
Prover pressure (Pp) (psig)	45.3	45.1	45.1	45.2	45.1
Corrected Encoder Count (It) [V1-V3]	0.0	0.0	0.0	0.0	0.0
Calculated Densities					
(A2) Density of Air (DENa) (gm/cc)	0.001195	0.001196	0.001196	0.001196	0.001196
(A5) Water Density (RHOw) (gm/cc)	0.996887	0.996887	0.996887	0.996873	0.996873
Volume Calculation					
(A3 * A12) True Mass of Water (Mw) (gm)	75504.071	75503.285	75504.531	75504.517	75504.132
(A13) Volume of Water (Vw) (ml)	75739.849	75739.061	75740.311	75741.361	75740.974
Correction Factors to Standard Conditions					
(A18) Effect of Press. on Water (CPLp)	1.000145	1.000144	1.000144	1.000145	1.000144
(A15) Temp. correction CTS for SVP	1.000493	1.000493	1.000493	1.000496	1.000496
(A16) Pressure correction CPS for SVP	1.000028	1.000028	1.000028	1.000028	1.000028
(A19) Temp. correction CTSp for SVP	0.999508	0.999507	0.999507	0.999504	0.999504
Calculated Volume					
(A21) Volume at Std. Conditions (mL)	75689.490	75688.703	75689.952	75690.698	75690.387
Calculated Deviation					
Run percent deviation from average	-0.0005%	-0.0015%	0.0001%	0.0011%	0.0007%

Average Volume at Standard Conditions	75689.846	ml	6.955208	Expanded uncertainty by unit of measure
	75.689846	Liters	0.006955	
	0.0756898	Cubic meters	0.000007	
	19.99514	Gallons	0.001837	
	0.4760748	Barrels	0.000044	
	4618.88	Cubic Inches	0.424433	
Repeatability	0.00264%			Expanded uncertainty expressed in percentage
Laboratory Room Temperature	60.0	Ambient (F)	0.0092%	
Laboratory Room Relative Humidity	93.0	% (rh)		
Laboratory Room Barometric Pressure	758.4	mm / Hg		

Percent volume change from previous waterdraw: -0.01199%

Uncertainty for this calibration is the sum of Calibration Measurement Capability (CMC) and the uncertainty of volume. CMC is based on the accuracy of the measurement equipment used during this calibration. Uncertainty of volume is based on the variance of the individual runs performed on this calibration. Uncertainty is then multiplied by K, a coverage factor of 2 to give the reported expanded uncertainty which defines an interval with an approximate 95% confidence level. Calibration results published in this certificate were obtained using equipment capable of producing results that are traceable through NIST to the International System of Units (SI). Measurement equipment calibration is performed by accredited laboratories (reports on file). The purchase order number, sales order number and serial number on this report is the unique traceability used in referencing measurement traceability for artifacts identified in this report. Results of this calibration apply only to the specified unit on this certificate. Reported volume is in accordance with API 4.9.4. This document may not be reproduced, except in its entirety, without written permission of FMD Distribution and Service.

Laboratory Tech. Performing Calibration:

Witnessed by:

Authorized FMD Quality Representative:

Date:

For:

TRACEABLE INSTRUMENTS USED

Air Temperature Thermometer :	D8664C
Switch Bar Temperature Thermometer :	D866B5
Prover Temperature Thermometer :	D866A5
Mechanical Pressure Gauge :	6610
Conductivity Meter :	545234
Test Weights :	DAS-25
Test Weights :	0

Test Weights :	DAS-17
Test Weights :	DAS-18
Test Weights :	DAS-19
Test Weights :	DAS-20
Test Weights :	DAS-21
Test Weights :	DAS-22
Test Weights :	DAS-23
Test Weights :	DAS-24



**DISTRIBUTION
AND
SERVICE**

Gravimetric Waterdraw Certificate

Customer:	GAGE WESTERN, LLC	Job Number:	004283
Customer P.O. #:	N/A	Prover Serial Number:	000737
Description / Model Number:	H44025(TT)1AASGAAWCS	Prover Tag Number:	N/A
Test Procedure:	API 4.9.4	SECONDARY VOLUME	
Test Date:	December 6, 2021		
Customer Address:	MIDLAND, TX		
Compressibility factor for water (°F/psig)	3.2E-06	Area Thermal Expansion Coefficient (Ga)	1.92E-05
Elevation (ft)	60	Detector Thermal Expansion Coefficient (Gf)	9.60E-06
Standard Temperature (°F)	60.0	Modulus of Elasticity (flow tube) (E)	2.80E+07
Standard Pressure (psig)	0.0	Flow Tube Inside Diameter (inches) (ID)	16.997
Field Test Weight Density (gm/cc)	7.85	Flow Tube Wall Thickness (inches) (WT)	0.9655
Reference Test Weight density (gm/cc)	8.00	Conductivity Reading (uS)	15

Collected Data	Fill 1	Fill 2	Fill 3	Fill 4	Fill 5
Run Time (sec)	73	73	71	105	109
Apparent Mass of Water (Ww) (gm)	56610.2	56609.2	56611.4	56609.4	56611.6
Air Temperature (°F)	65.8	65.8	65.5	65.3	65.2
Detector Bar Temperature (Td) (°F)	70.3	70.4	70.5	70.5	70.6
Prover Temperature (Tp) (°F)	76.3	76.3	76.2	76.2	76.1
Prover pressure (Pp) (psig)	45.1	45.1	45.4	45.1	45.2
Corrected Encoder Count (3t) [V2-V3]	0.0	0.0	0.0	0.0	0.0
Calculated Densities					
(A2) Density of Air (DENa) (gm/cc)	0.001207	0.001207	0.001208	0.001208	0.001209
(A5) Water Density (RHOw) (gm/cc)	0.997145	0.997145	0.997159	0.997159	0.997173
Volume Calculation					
(A3 * A12) True Mass of Water (Mw) (gm)	56670.267	56669.266	56671.502	56669.522	56671.735
(A13) Volume of Water (Vw) (ml)	56832.524	56831.520	56832.964	56830.979	56832.400
Correction Factors to Standard Conditions					
(A18) Effect of Press. on Water (CPLp)	1.000144	1.000144	1.000145	1.000144	1.000145
(A15) Temp. correction CTS for SVP	1.000412	1.000413	1.000412	1.000412	1.000411
(A16) Pressure correction CPS for SVP	1.000028	1.000028	1.000029	1.000028	1.000028
(A19) Temp. correction CTSp for SVP	0.999588	0.999587	0.999588	0.999588	0.999589
Calculated Volume					
(A21) Volume at Std. Conditions (mL)	56799.339	56798.279	56799.665	56797.795	56799.215
Calculated Deviation					
Run percent deviation from average	0.0008%	-0.0010%	0.0014%	-0.0019%	0.0006%

Average Volume at Standard Conditions	56798.859	ml	6.404385	Expanded uncertainty by unit of measure
	56.798859	Liters	0.006404	
	0.0567989	Cubic meters	0.000006	
	15.00467	Gallons	0.001692	
	0.3572541	Barrels	0.000040	
	3466.08	Cubic Inches	0.390820	
Repeatability	0.00329%			Expanded uncertainty expressed in percentage
Laboratory Room Temperature	60.0	Ambient (F)	0.0113%	
Laboratory Room Relative Humidity	93.0	% (rh)		
Laboratory Room Barometric Pressure	758.4	mm / Hg		

Percent volume change from previous waterdraw:	0.00566%
--	----------

Uncertainty for this calibration is the sum of Calibration Measurement Capability (CMC) and the uncertainty of volume. CMC is based on the accuracy of the measurement equipment used during this calibration. Uncertainty of volume is based on the variance of the individual runs performed on this calibration. Uncertainty is then multiplied by K, a coverage factor of 2 to give the reported expanded uncertainty which defines an interval with an approximate 95% confidence level. Calibration results published in this certificate were obtained using equipment capable of producing results that are traceable through NIST to the International System of Units (SI). Measurement equipment calibration is performed by accredited laboratories (reports on file). The purchase order number, sales order number and serial number on this report is the unique traceability used in referencing measurement traceability for artifacts identified in this report. Results of this calibration apply only to the specified unit on this certificate. Reported volume is in accordance with API 4.9.4. This document may not be reproduced, except in its entirety, without written permission of FMD Distribution and Service.

Laboratory Tech. Performing Calibration: [Signature]

Date: 12/06/2021

Witnessed by: [Signature]

For: Gage Western, LLC

Authorized FMD Quality Representative: _____

TRACEABLE INSTRUMENTS USED

Air Temperature Thermometer:	D8664C
Switch Bar Temperature Thermometer:	D866B5
Prover Temperature Thermometer:	D866A5
Mechanical Pressure Gauge:	6610
Conductivity Meter:	545234

Test Weights:	DAS-25
Test Weights:	0

Test Weights:	DAS-17
Test Weights:	DAS-18
Test Weights:	DAS-19
Test Weights:	DAS-20
Test Weights:	DAS-21
Test Weights:	DAS-22
Test Weights:	DAS-23
Test Weights:	DAS-24



Gravimetric Waterdraw Certificate

Customer:	GAGE WESTERN, LLC	Job Number :	004283
Customer P.O. # :	N/A	Prover Serial Number :	000737
Description / Model Number :	H44025(TT)1AASGAAWCS	Prover Tag Number:	N/A
Test Procedure :	API 4.9.4	TERTIARY VOLUME	
Test Date :	December 6, 2021		
Customer Address:	MIDLAND, TX		
Compressibility factor for water (°F/psig)	3.2E-06	Area Thermal Expansion Coefficient (Ga)	1.92E-05
Elevation (ft)	60	Detector Thermal Expansion Coefficient (GI)	9.60E-06
Standard Temperature (°F)	60.0	Modulus of Elasticity (flow tube) (E)	2.80E+07
Standard Pressure (psig)	0.0	Flow Tube Inside Diameter (inches) (ID)	16.997
Field Test Weight Density (gm/cc)	7.85	Flow Tube Wall Thickness (inches) (WT)	0.9655
Reference Test Weight density (gm/cc)	8.00	Conductivity Reading (uS)	15

Collected Data	Fill 1	Fill 2	Fill 3	Fill 4	Fill 5
Run Time (sec)	35	36	47	47	48
Apparent Mass of Water (Ww) (gm)	18829.0	18829.2	18829.8	18829.6	18829.6
Air Temperature (°F)	67.6	67.5	67.6	67.8	67.6
Detector Bar Temperature (Td) (°F)	71.1	71.1	71.1	71.1	71.2
Prover Temperature (Tp) (°F)	75.8	75.8	75.8	75.7	75.9
Prover pressure (Pp) (psig)	45.4	45.3	45.4	45.2	45.1
Corrected Encoder Count (3t) [V1-V2]	0.0	0.0	0.0	0.0	0.0
Calculated Densities					
(A2) Density of Air (DENa) (gm/cc)	0.001203	0.001203	0.001203	0.001203	0.001203
(A5) Water Density (RHOw) (gm/cc)	0.997215	0.997215	0.997215	0.997229	0.997201
Volume Calculation					
(A3 * A12) True Mass of Water (Mw) (gm)	18848.909	18849.113	18849.710	18849.502	18849.510
(A13) Volume of Water (Vw) (ml)	18901.550	18901.754	18902.353	18901.879	18902.418
Correction Factors to Standard Conditions					
(A18) Effect of Press. on Water (CPLp)	1.000145	1.000145	1.000145	1.000145	1.000144
(A15) Temp. correction CTS for SVP	1.000410	1.000410	1.000410	1.000408	1.000413
(A16) Pressure correction CPS for SVP	1.000029	1.000028	1.000029	1.000028	1.000028
(A19) Temp. correction CTSp for SVP	0.999590	0.999590	0.999590	0.999592	0.999587
Calculated Volume					
(A21) Volume at Std. Conditions (mL)	18890.513	18890.736	18891.316	18890.899	18891.362
Calculated Deviation					
Run percent deviation from average	-0.0024%	-0.0012%	0.0019%	-0.0003%	0.0021%

Average Volume at Standard Conditions	18890.965	ml	5.705410	Expanded uncertainty by unit of measure
	18.890965	Liters	0.005705	
	0.0188910	Cubic meters	0.000006	
	4.99046	Gallons	0.001507	
	0.1188206	Barrels	0.000036	
	1152.80	Cubic Inches	0.348166	
Repeatability	0.00449%			Expanded uncertainty expressed in percentage
Laboratory Room Temperature	60.0	Ambient (F)	0.0302%	
Laboratory Room Relative Humidity	93.0	% (rh)		
Laboratory Room Barometric Pressure	758.4	mm / Hg		

Percent volume change from previous waterdraw:	-0.06923%
--	-----------

Uncertainty for this calibration is the sum of Calibration Measurement Capability (CMC) and the uncertainty of volume. CMC is based on the accuracy of the measurement equipment used during this calibration. Uncertainty of volume is based on the variance of the individual runs performed on this calibration. Uncertainty is then multiplied by K, a coverage factor of 2 to give the reported expanded uncertainty which defines an interval with an approximate 95% confidence level. Calibration results published in this certificate were obtained using equipment capable of producing results that are traceable through NIST to the International System of Units (SI). Measurement equipment calibration is performed by accredited laboratories (reports on file). The purchase order number, sales order number and serial number on this report is the unique traceability used in referencing measurement traceability for artifacts identified in this report. Results of this calibration apply only to the specified unit on this certificate. Reported volume is in accordance with API 4.9.4. This document may not be reproduced, except in its entirety, without written permission of FMD Distribution and Service.

Laboratory Tech. Performing Calibration: *[Signature]*

Date: 12/06/2021

Witnessed by: *[Signature]*

For: Gage Western, LLC

Authorized FMD Quality Representative: _____

TRACEABLE INSTRUMENTS USED

Air Temperature Thermometer :	D8664C
Switch Bar Temperature Thermometer :	D866B5
Prover Temperature Thermometer :	D866A5
Mechanical Pressure Gauge :	6610
Conductivity Meter :	545234

Test Weights :	DAS-25
Test Weights :	0

Test Weights :	DAS-17
Test Weights :	DAS-18
Test Weights :	DAS-19
Test Weights :	DAS-20
Test Weights :	DAS-21
Test Weights :	DAS-22
Test Weights :	DAS-23
Test Weights :	DAS-24

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

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

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

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

23 October, 2018

Emerson Automation Solutions

6021 Innovation Blvd

Shakopee, MN 55379

**EMERSON**

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

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