



ACCREDITED CALIBRATION CERTIFICATE



2033.01

This is to certify that the following meter was calibrated in accordance with procedures LWI-112 and LWI-115 for performing primary gravimetric calibrations in the Micro Motion Measurement Technology Test Lab. This calibration is compliant to ISO 17025:2005 & ANSI/NCSL Z540-1-1994. The meter has been calibrated with standards whose accuracies are traceable to N.I.S.T.

STANDARDS USED

PFS7K, PFS150

One, or both, of these primary flow stands may have been used for this calibration.

ESTIMATED UNCERTAINTY $\pm 0.014\%$

The uncertainty is estimated using a coverage factor (k) of 2, providing a confidence level of approximately 95 %

STATUS☐ As Found☐ As Left**CUSTOMER**

Name:

Address:

SALES ORDER

Number:

TEST DATE & TIME

1/0/1900 12:00:00 AM

TEST COMMENTS

0

SENSOR DATA

Serial Number: 0

Model: 0

Size: 0

Material: Special

Press Rating: 0

Temp Rating: 0

SENSOR CALIBRATION

Flow Calibration Factor: 699.590027

D1: 0.00000

D2: 1.00000

K1: 10629.460

K2: 12624.410

FD: 198.96

Density Temp Coeff.: 4.42

TRANSMITTER DATA

Serial Number: 14359078

Model: 650

Mass Flow Units: Pounds/minute

Density Units: Grams/cubic centimeter

Temperature Units: Degrees Celsius

Mass Flow Cutoff: 14.286

Mass Flow Damping: 0.16

Flow Direction: Forward flow only

Frequency Flow Rate: 0

Frequency Span: 277.235229

METER SPECIFICATIONS

Flow Accuracy: 0.00 %

Flow Repeatability: 0.00 %

Zero Stability: 0.000 lb/min

Density Accuracy: 0.0000 g/cc

Density Repeatability: 0.0000 g/cc



TEST TECHNICIAN**DATE**

QUALITY ASSURANCE REVIEW**DATE**7070 Winchester Circle
Boulder, CO 80301

Micro Motion, Inc.

Mass Flowmeter Calibration Certificate

0

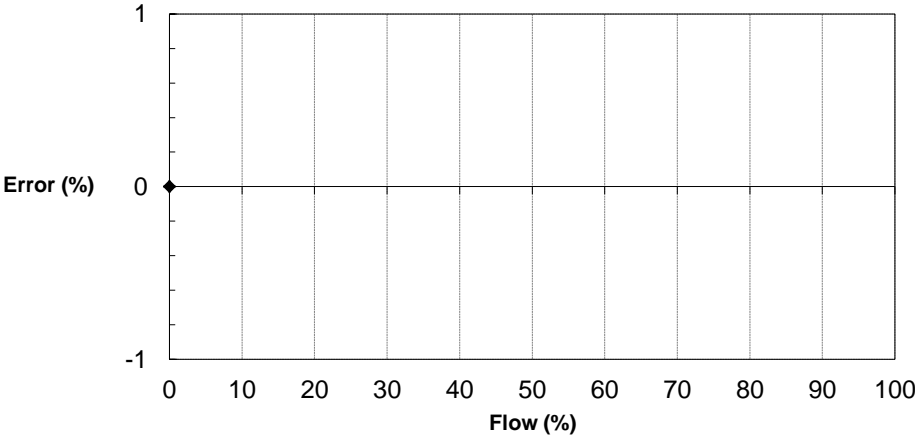
Product Code	Serial ID	Order ID	Line	Item	Customer Tag
CMF050M320N0A2E2ZZ					
2400SIA11B2EZCZ					

FLOW VERIFICATION - FLOW CAL FACTORS SAME AS INITIAL CAL (AS FOUND / AS LEFT)

Process

Detail

Process ID:
Process Time: 1900.01.00 0:00:00
Process Stand: PFS150
Stand Uncertainty: ± 0.014%
Fluid: H2O
100% Rate: 0.00 KG/MIN
Pickoff: 1
100% P/T: #DIV/0!



Results

Status: PASS
D1: 0.0
D2: 1.0
K1: 10629.460
K2: 12624.410
DT: 4.42
FD: 198.96
DTG: 0
DFQ1: 0
DFQ2: 0
FlowCal: 699.590027
FFQ: 0
FTG: 0
DensCal: 10629126244.42
FCF: 699.59
FT: 0027

Flow (%)	Nominal Flow Rate (kg/min)	Meter Total (kg)	Reference Total (kg)	Error (%)	Specification (±%)
#DIV/0!	22.69	113.762	103.072	10.371	#DIV/0!
#DIV/0!	34.03	146.824	141.897	3.473	#DIV/0!
#DIV/0!	45.37	188.204	177.401	6.090	#DIV/0!
#DIV/0!	0.00	0.000	0.000	#DIV/0!	#DIV/0!

D. Bates
Technician

TEST DATE & TIME 11:06:44 02.04.14

TEST COMMENTS:

SENSOR DATA

Serial Number:
Model:
Size:
Material: Special
Press Rating:
Temp Rating:

SENSOR CALIBRATION

Flow Calibration Factor: 699.590027
D1: 0.00000
D2: 1.00000
K1: 10629.460
K2: 12624.410
FD: 199
Density Temp Coeff.: 4.42

TRANSMITTER DATA

Serial Number: 14359078
Model: 650
Mass Flow Units: Pounds/minute
Density Units: Grams/cubic centimeter
Temperature Units: Degrees Celsius
Mass Flow Cutoff: 14.285955
Mass Flow Damping: 0.16
Flow Direction: Forward flow only
Frequency Flow Rate: 0
Frequency Span: 277.235229

Meter Specifications

Flow Accuracy:	%
Flow Repeatability:	%
Zero Stability:	lb/min
Density Accuracy:	g/cc
Density Repeatability:	g/cc

<u>Nominal Flow Rate</u>	lb/min
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<u>Meter zero</u>	-0.01	nsec
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Data Point	Set Point	UUT Flow	UUT Temp	UUT Density	UUT Zero nsec	Error Dig-Scale %	Error Hz-Scale %	Density Error
0	50.00							
1	75.00							
2	100.00							

Temp Error	UUT Total Pulse	UUT Dig Total	UUT Dig Total1	Reset Cnt N	Corrected Scale Total lb	Start Scale Gross lb	Start Scale Corr lb	End Scale Gross lb
			250.7320		227.1710			
			323.6003		312.7400			
			414.8024		390.9925			

End Scale	Real-time	Inlet	Diff Press	Inlet	Exit Temp	Fluid	Ambient	Ambient
Corr lb	Bouyancy	Press psig	psid	Temp °C	°C	Density g/cc	Press psia	Temp °C

Ambient % RH	VFD Speed %	Batch Time sec	Rdgs Avg'd	Timestamp	Analog Output mA
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Error Limit	Flow Rate	FALSE				
Turndown	lb/min	% Flow	+ Limit	- Limit	+ D Limit	- D Limit
1.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
1.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
2.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
2.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
3.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
3.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
4.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
4.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
5.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
5.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
6.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
6.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
7.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
7.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
8.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
8.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
9.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
9.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
10.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
10.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
11.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
11.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
12.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
12.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
13.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
13.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
14.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
14.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
15.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
15.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
16.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
16.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
17.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
17.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
18.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
18.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
19.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
19.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
20.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
20.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
21.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
21.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
22.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
22.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
23.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
23.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
24.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
24.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
25.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0

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77.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
78.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
78.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
79.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
79.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
80.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
80.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
81.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
81.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
82.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
82.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
83.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
83.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
84.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
84.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
85.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
85.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
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86.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
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87.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
88.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
88.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
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89.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
90.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
90.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
91.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
91.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
92.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
92.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
93.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
93.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
94.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
94.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
95.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
95.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
96.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
96.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
97.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
97.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
98.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
98.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
99.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
99.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
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100.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
101.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
101.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
102.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
102.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
103.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0

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186.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
186.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
187.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
187.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
188.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
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189.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
189.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
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190.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
191.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
191.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
192.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
192.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
193.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
193.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
194.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
194.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
195.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
195.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
196.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
196.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
197.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
197.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
198.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
198.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
199.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
199.5	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0
200.0	0.000	#DIV/0!	#DIV/0!	#DIV/0!	0	0