

# CASE STUDY

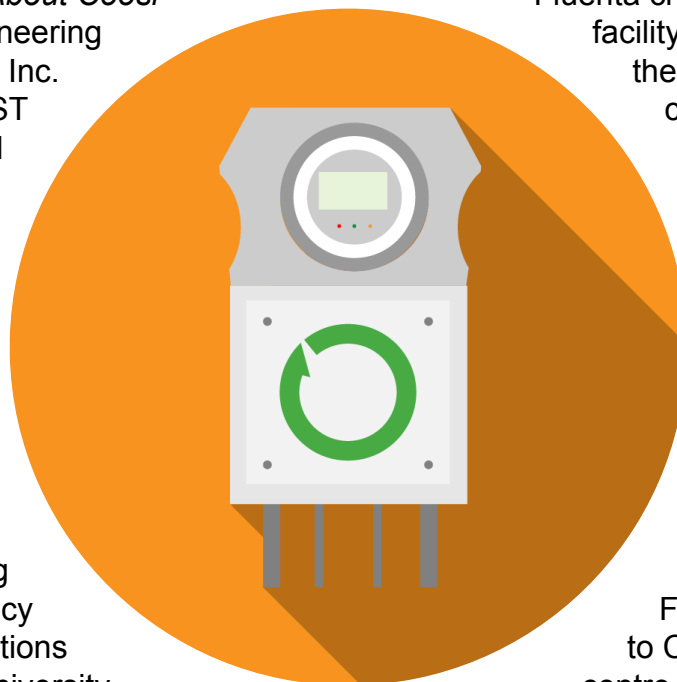
INDUSTRY: OIL & GAS PUBLISHING DATE: SEPTEMBER 2016

## When accuracy matters

Fluenta tested its 160 Flare Gas Meter at the renowned CEESI testing facility in Colorado on behalf of Kuwait Oil Company. The results show that Fluenta meters perform with an uncertainty of less than 3% without prior calibration and even at low flow velocity.

### *About Ceesi*

Colorado Engineering Experiment Station, Inc. (CEESI) performs NIST traceable primary and secondary calibration for numerous types of flow meters and fluids. In addition to quality calibrations, CEESI offers calibration-related engineering services, valve testing, and a wide range of flow measurement training services and consultancy offerings. Their operations began in 1951 at the University of Colorado.

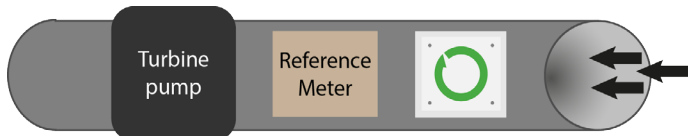


Fluenta chose the CEESI testing facility in Colorado because of the accreditation with our customer. As opposed to other facilities, CEESI also offers a custom piping set-up enabling Fluenta to test the meter on a 30" spool piece and at low flow conditions of 1 to 20 m/s.

### *Technical setup*

The data from both the reference meter and the Fluenta meter was feed to CEESI's data acquisition centre. CEESI collected these measurements for a period of 30

seconds and calculated the average value including error for that period to reflect stable flow conditions.

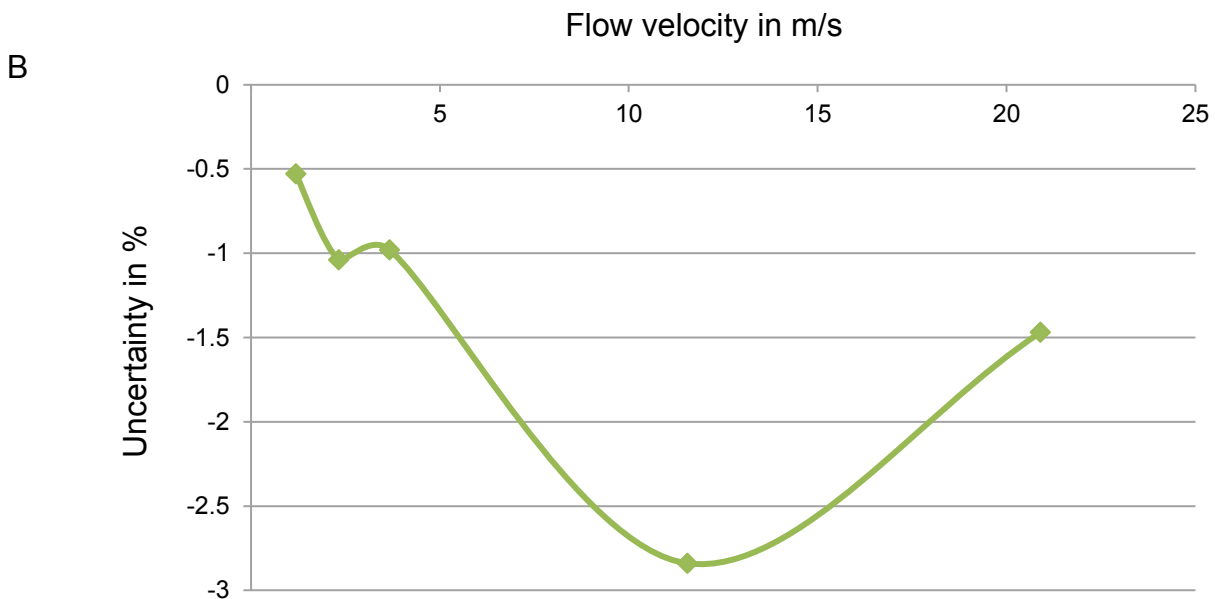
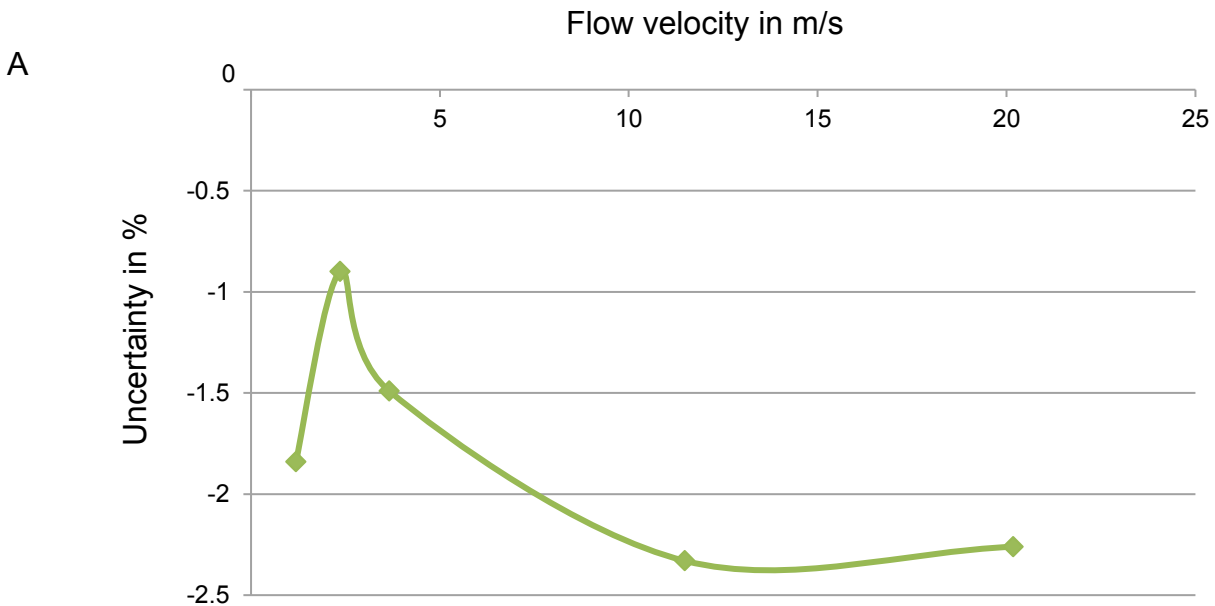


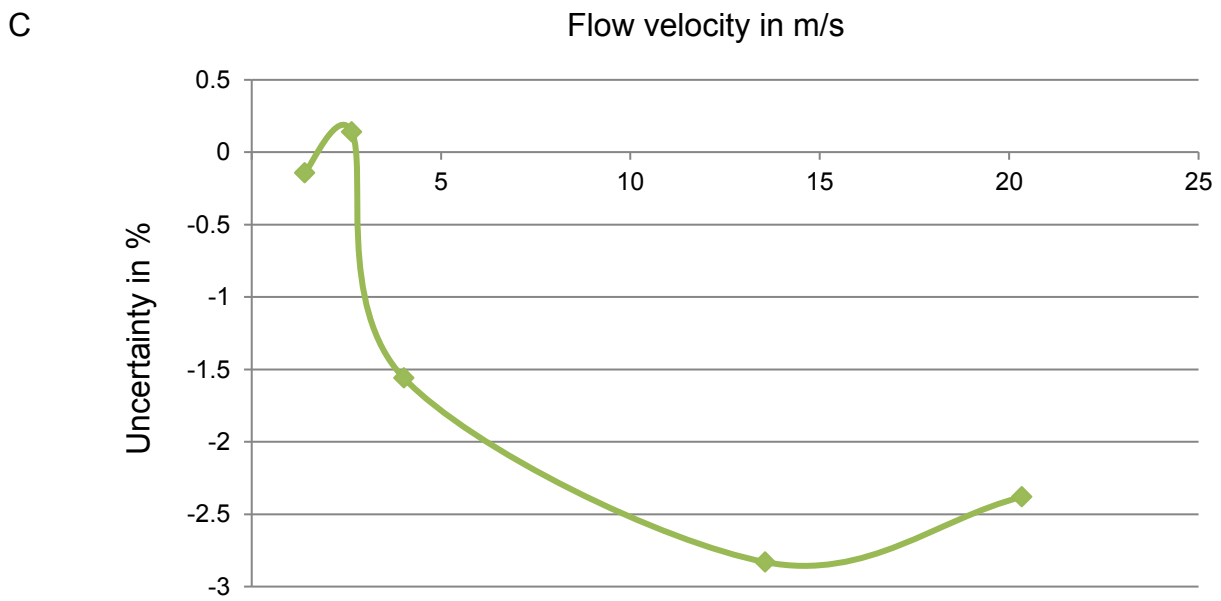
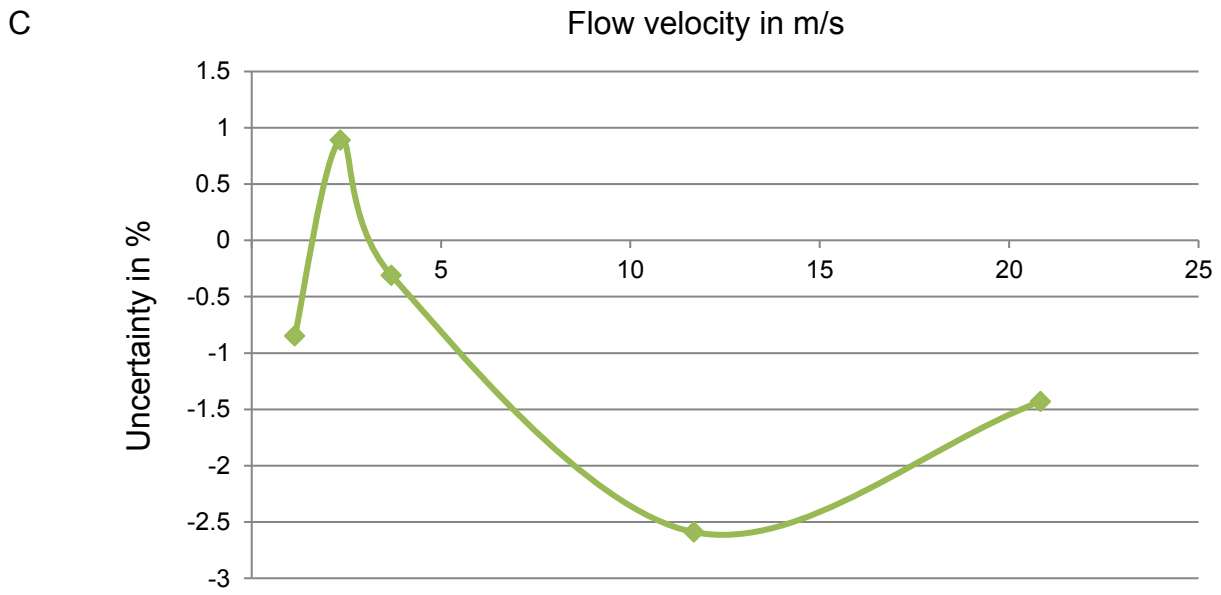
Test setup with reference meter

### Results and interpretation

The results show that taken “straight out of the box” and without any initial calibration, the Fluenta 160 performs with an uncertainty below 3%. These results are achieved even at low flow velocity, which typically is a challenge in flow measurement. These findings are confirmed by multiple results from just one test session - a rare occurrence at any test site.

### Graphs





See the following pages for CEESI certificates.

CEESI Certificates

A



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**COLORADO ENGINEERING  
EXPERIMENT STATION INC.**

...the primary source for flow measurement solutions...



IOWA HIGH FLOW FACILITY  
2365 240th St.  
Garner, IA 50438  
Phone: 641-923-3664  
FAX: 641-923-3693

Calibration of a Ultrasonic  
Model: Serial Number: 08-FIT-6637  
For: Fluenta Order: 1767  
Data File: 16FLUE-0016\_1 Job: CE24025 Date: 25 March 2016  
Meter Diameter: 29 inches  
Test gas: AIR Standard density= 0.074896 lbm/ft<sup>3</sup>  
at standard conditions of 529.67 °R, and 14.696 Psia  
MtrVel: Meter velocity in meters per second  
m/sec: Meter velocity in meters per second  
%Error: %Error of calculated from reported velocity  
Press: Meter BODY static pressure in bara  
Temp: EXIT temperature, degrees Celcius  
ACMH: Volumetric flowrate at meter BODY, actual cubic meters per hour  
Density: Flowing density at meter BODY, in kilograms per cubic meter

Pt.	MtrVel	m/sec	%Error	Press	Temp	ACFH	Density
1	19.728	20.184	-2.26	0.83686	9.29	30965	1.0326
2	11.223	11.491	-2.33	0.82944	10.1	17629	1.0204
3	3.6055	3.6602	-1.49	0.82656	10.3	5615.1	1.0164
4	2.3359	2.3571	-0.899	0.82634	10.7	3616.1	1.0147
5	1.1632	1.185	-1.84	0.8262	9.91	1817.9	1.0173

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Calibration of a Ultrasonic

Model: Serial Number: 10-FIT-6637  
For: Fluenta Order: 1767  
Data File: 16FLUE-0020\_1 Job: CE24025 Date: 25 March 2016  
Meter Diameter: 29 inches  
Test gas: AIR Standard density= 0.074896 lbm/ft<sup>3</sup>  
at standard conditions of 529.67 °R, and 14.696 Psia  
MtrVel: Meter velocity in meters per second  
m/sec: Meter velocity in meters per second  
%Error: %Error of calculated from reported velocity  
Press: Meter BODY static pressure in bara  
Temp: EXIT temperature, degrees Celcius  
ACMH: Volumetric flowrate at meter BODY, actual cubic meters per hour  
Density: Flowing density at meter BODY, in kilograms per cubic meter

Pt.	MtrVel	m/sec	%Error	Press	Temp	ACFH	Density
1	20.593	20.9	-1.47	0.83691	8.55	32063	1.0354
2	11.235	11.563	-2.84	0.82912	9.4	17739	1.0227
3	3.6245	3.6605	-0.983	0.82602	10.5	5615.6	1.015
4	2.3025	2.3267	-1.04	0.82579	10.9	3569.3	1.0133
5	1.1926	1.199	-0.534	0.82582	11.1	1839.4	1.0127



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#### Calibration of a Ultrasonic

Model: Serial Number: 19-FIT-6637  
For: Fluenta Order: 1767  
Data File: 16FLUE-0022\_1 Job: CE24025 Date: 26 March 2016  
Meter Diameter: 29 inches  
Test gas: AIR Standard density= 0.074896 lbm/ft<sup>3</sup>  
at standard conditions of 529.67 °R, and 14.696 Psia  
MtrVel: Meter velocity in meters per second  
m/sec: Meter velocity in meters per second  
%Error: %Error of calculated from reported velocity  
Press: Meter BODY static pressure in bara  
Temp: EXIT temperature, degrees Celcius  
ACMH: Volumetric flowrate at meter BODY, actual cubic meters per hour  
Density: Flowing density at meter BODY, in kilograms per cubic meter

Pt.	MtrVel	m/sec	%Error	Press	Temp	ACFH	Density
1	20.535	20.833	-1.43	0.84621	-0.0779	31960	1.0801
2	11.381	11.684	-2.59	0.83807	0.395	17924	1.0679
3	3.6761	3.6875	-0.309	0.83507	0.619	5656.9	1.0632
4	2.3576	2.3368	0.89	0.83516	1.5	3584.8	1.0599
5	1.1331	1.1428	-0.849	0.83542	0.354	1753.2	1.0646



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Calibration of a Ultrasonic  
Model: Serial Number: 22-FIT-6637  
For: Fluenta Order: 1767  
Data File: 16FLUE-0033\_1 Job: CE24025 Date: 28 March 2016  
Meter Diameter: 29 inches  
Test gas: AIR Standard density= 0.074896 lbm/ft<sup>3</sup>  
at standard conditions of 529.67 °R, and 14.696 Psia  
MtrVel: Meter velocity in meters per second  
m/sec: Meter velocity in meters per second  
%Error: %Error of calculated from reported velocity  
Press: Meter BODY static pressure in bara  
Temp: EXIT temperature, degrees Celcius  
ACMH: Volumetric flowrate at meter BODY, actual cubic meters per hour  
Density: Flowing density at meter BODY, in kilograms per cubic meter

Pt.	MtrVel	m/sec	%Error	Press	Temp	ACFH	Density
1	19.854	20.338	-2.38	0.84061	-1.8	31201	1.0798
2	13.172	13.555	-2.83	0.83437	-1.65	20794	1.0712
3	3.9545	4.017	-1.56	0.82999	-1.21	6162.4	1.0638
4	2.6462	2.6425	0.14	0.82983	-2.09	4053.8	1.0671
5	1.399	1.401	-0.143	0.82971	-1.94	2149.3	1.0664



Want to know more?

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