



NATIONAL TYPE EVALUATION PROGRAM

Certificate of Conformance

for Weighing and Measuring Devices

For:
 Meter Indicating Volume
 Stationary and Vehicle Tank Meter
 Positive Displacement Meter
 Model: 700-AA-YYY-XXXXXX
 Sizes: 1-1/2, 2, 3 and 4 inch

Submitted By:
 Total Control Systems (Murray Equipment, Inc.)
 215 Charleston Place
 Fort Wayne, IN 46808
 Tel: 260-484-0382
 Fax: 260-484-9230
 Contact: Steve Murray
 Email: smurray@murrayequipment.com
 Web site: www.tcsmeters.com

Standard Features and Options

Basic Model 700:

AA			YYY	XXXXXX
Meter Size Indicates Flange Size and Range of Flow			Meter Material (Housing and Rotors)	Non-metrological features assigned by Murray Equipment, Inc.
Meter Sizes	Flange Size	Range of Flow	SP = Anodized Aluminum SPA = Anodized Aluminum SPD = Ductile Iron LP = Anodized Aluminum** SSD = Stainless Steel***	
15 = 1.5 inch	1-1/2	5 gpm - 60 gpm 5 gpm - 60 gpm*** 12 gpm - 60 gpm**		
20 = 2 inch	1-1/2 & 2	10 gpm -100 gpm 20 gpm -100 gpm*** 20 gpm -100 gpm**		
25 = 2 inch	2	10 gpm -150 gpm		
30 = 3 inch	2, 3, & 4	20 gpm -200 gpm 20 gpm -200 gpm*** 20 gpm -200 gpm**		
35 = 3 inch	3	20 gpm -300 gpm		
40 = 4 inch*	3 & 4	40 gpm -500 gpm		
45 = 4 inch*	4	40 gpm -500 gpm		

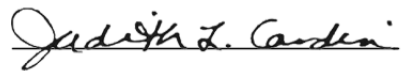
* Stationary Applications Only ** LP: Fuels and Refrigerants ***Diesel Exhaust Fluid: 1-1/2", 2" and 3" Only

Standard Mechanical Device with the Following Options:

- Preset Volume
- Automatic Temperature Compensation
- Standard or Optional Ticket Printer

This device was evaluated under the National Type Evaluation Program and was found to comply with the applicable technical requirements of "NIST Handbook 44: Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages.


 Randy Jennings
 Chairman, NCWM, Inc.


 Judy Cardin
 Chairman, National Type Evaluation Program Committee
 Issued: May 21, 2010

1135 M Street, Suite 110 / Lincoln, Nebraska 68508

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Total Control Systems (Murray Equipment, Inc.)

Meter Indicating Volume / 700-AA-YYY-XXXXXX

Application: For use in metering liquids as shown in the product family listed in the table below.

The 1-1/2, 2 and 3 inch meter sizes can be used in stationary and vehicle tank applications. The 4-inch meter can ONLY be used in a stationary application. Only the LP meter may be used to measure fuels and refrigerants. Only the SSD meter may be used to measure DEF. The meters must be used with approved and compatible mechanical or electronic indicating elements.

Product Families:

Product Family	Typical Products	Viscosity Centistokes
Fuels, Lubricants, Industrial and Food Grade Liquid Oils	RO 815 Oil, Diesel, Gasoline	.519-648
Solvents General	RP-1039	0.95
Alcohols, Glycols and Water Mixes Thereof	Ethanol, Ethylene Glycol	1.2-2.28
Fuels and Refrigerants	LPG	XX
Clear Liquid Fertilizers, Diesel Exhaust Fluid	DEF	1.4

Identification: A permanent ID badge is riveted to the front of the meter body.

Sealing: The meter calibration adjustment may be sealed with a wire security seal threaded through two drilled screw heads that secure the access plate to the meter casing.

Test Conditions: This certificate superseded Certificate of Conformance Number 99-097A6 and was issued to clarify the range of meter flow rates covered by the certificate. No additional testing was required. Previous tests conditions are listed below for reference.

Certificate of Conformance Number 99-097A6: This certificate supersedes Certificate of Conformance Number 99-097A5. The Model 700-20-SSD-XXXXXX meter, interfaced with the mechanical Veeder-Root indicating element, was submitted for evaluation measuring Diesel Exhaust Fluid (DEF). Four tests each at five flow rates ranging from 20 gallons per minute (GPM) up to 100 GPM were conducted applying the acceptance tolerance of $\pm 0.30\%$ for normal tests and $\pm 0.50\%$ for special tests as specified in Handbook 44, Section 3.32. Repeatability tolerance applied was 0.12%. The tests were repeated after 200 000 gallons of throughput.

Certificate of Conformance Number 99-097A5: This certificate supersedes Certificate of Conformance Number 99-097A4 and is issued to add the products RO 815 Oil, RP-1039, Ethanol, and Ethylene Glycol. Test tolerances applied were $\pm 0.2\%$ for normal tests and $\pm 0.5\%$ for special tests.

Certificate of Conformance Number 99-097A4: This certificate superseded Certificate of Conformance Number 99-097A3 and was issued to correct the Product Table information that was located on page 2 of this NTEP CC. No additional testing was required.

Certificate of Conformance Number 99-097A3: This certificate superseded Certificate of Conformance Number 99-097A2. The Model 700-20-LP-XXXXXX meter, interfaced with the MID:COM Model E:Count indicating element, was submitted for evaluation measuring liquefied petroleum gas (LPG). The emphasis of the evaluation was on design, operation, performance, and interaction with the indicating element. Four tests each at five flow rates ranging from 20 gallons per minute (gpm) up to 80 gpm were conducted applying the acceptance tolerance of 0.6% as specified in Handbook 44, Section 3.32. The tests were repeated after 200 000 gallons of throughput.

Certificate of Conformance Number 99-097A2: This certificate superseded Certificate of Conformance Number 99-097A1 and was issued to clarify the model numbers, remove several models no longer covered by this certificate, and clarify the specific range of flow. No additional testing was necessary.



Total Control Systems (Murray Equipment, Inc.)

Meter Indicating Volume / 700-AA-YYY-XXXXXX

Certificate of Conformance Number 99-097A1: This certificate superseded Certificate of Conformance Number 99-097 and was issued to change flow rates of 1-1/2, 2, and 3 inch meters and to include a new size meter (4 inch). The emphasis of the evaluation was on design, performance, and the operation of the meter. Testing was performed on the Model 700-25SP4AT meter interfaced to a Veeder-Root Model 07887 mechanical register at the manufacturer's facility. The meter was tested at normal (150 gpm), intermediate (75 gpm) and slow (12 gpm) delivery rates using varsol as the test liquid. A product depletion test was also performed. After 56 days and a throughput of 307,000 gallons the meter was retested using the same criteria. An acceptance tolerance of .15% for normal tests and .45% for special tests was applied. The Model 700-40SPAG meter interfaced to a Veeder-Root Model 07887 mechanical register was also tested using varsol as the product at the manufacturer's facility. The meter was tested at normal (415 gpm), intermediate (200 gpm), and slow (44 gpm) delivery rates. After 55 days and a throughput of 1 100 000 gallons the tests were repeated using the same criteria. An acceptance tolerance of .2% was applied to normal tests and .5% for special tests was applied.

Certificate of Conformance Number 99-097: Emphasis of the evaluation was on the design and operation of the device based on field evaluation of two 700-20-SP-6 meters installed on one tank truck. One meter was dedicated to gasoline and the other to diesel fuel. An initial evaluation was conducted and after a throughput of more than 240 000 gallons for both meters, a second test was performed. Accuracy tests were conducted at three different flow rates. Air elimination tests were also conducted.

Evaluated By: R. D. Murdock (NC) 99-097, Michael Frailer (MD) 99-097A1, Will Rickey (CA) 99-097A3, D. Reiswig (CA) 99-097A5, J. Butler, A. Katalinic (NC) 99-097A6

Type Evaluation Criteria Used: NIST, Handbook 44: Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices, 2007. NCWM, Publication 14: Measuring Devices, 2007.

Conclusion: The results of the evaluation and information provided by the manufacturer indicate the device complies with applicable requirements.

Information Reviewed By: S. Patoray (NCWM), L. Bernetich (NCWM) 99-097A1, 99-097A2, 99-097A3, 99-097A4, 99-097A5, J. Truex (NCWM) 99-097A6, 99-097A7

Example of Device:



Model 700 Meter