National Conference on Weights and Measures
15245 Shady Grove Road, Suite 130 • Rockville, MD 20850

National Type Evaluation Program
Certificate of Conformance
for Weighing and Measuring Devices

For:
Wholesale Meter
Loading Rack Turbine Meter
Model: K2-XX-XX-X-X-X-X-X*

Submitted by:
FMC Measurement Solutions
Smith Meter, Inc.
1602 Wagner Avenue
Erie, PA 16514-0428
Tel: (814) 898-5000
Fax: (814) 899-3414
Contact: Rich Miller

Standard Features and Options

* The specific models of devices covered by this Certificate are listed on Page 2.

Horizontal or vertical mounting
Ball bearing rotor action
Journal bearing

Flow Rates:

Meter Size	Minimum Flow	Maximum Flow
1" Ball Bearing	8 gpm	80 gpm
1-1/2" Ball Bearing	13 gpm	130 gpm
2" Ball Bearing	25 gpm	250 gpm
3" Ball Bearing	60 gpm	600 gpm
4" Ball Bearing	100 gpm	1000 gpm
1-1/2" Journal Bearing	13 gpm	130 gpm
2" Journal Bearing	25 gpm	250 gpm
3" Journal Bearing	70 gpm	700 gpm
4" Journal Bearing	120 gpm	1200 gpm

Options: Stainless steel housing
Multiple pick-up coils

This device was evaluated under the National Type Evaluation Program (NTEP) and was found to comply with the applicable technical requirements of 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.

Dennis E. Ehrhart
Chairman, NCWM, Inc.

Ross J. Andersen
Chairman, National Type Evaluation Program Committee

Issue date: July 30, 2003

FMC Measurement Solutions
Loading Rack Turbine Wholesale Meter
Model: K2-XX-XX-X-X-X-X-X

Model Designation: The specific models of meters covered by this Certificate are identified by the following model designation:

<table>
<tr><th colspan="2">Model Designation: K2-XX-XX-X-X-X-X-X Series</th></tr>
<tr><td>Position 1: Code
K = Catalog Code</td><td>Position 6: End Connections
Non-metrological</td></tr>
<tr><td>Position 2: Product Line
2 = Turbine Meter</td><td>Position 7: Internal Configuration
Non-metrological</td></tr>
<tr><td>Position 3: Guardsman Bearing Series

B = J-H Horizontal Journal Bearings

C = LB Ball Bearings

E = LJ-H Horizontal Journal Bearings

F = LSJ-H Horizontal Journal Bearings (One Pickup Boss)

G = LSJ-H Horizontal Journal Bearings (Two Pickup Bosses)

P = LJ-V Vertical Journal Bearings

R = LSJ-V Vertical Journal Bearings (One Pickup Boss)

S = LSJ-V Vertical Journal Bearings (Two Pickup Bosses)</td><td>Position 8: Pickup Coils and Preamplifiers
<u>Meter Mounted Junction Box(es) With</u>
0 = 1 Pickup Coil Used Only for Field Installation of AccuLERT
1 = 1 Pickup Coil and Preamplifier
S = 1 Pickup Coil Arranged for Use With AccuLERT
2 = 2 Pickup Coils Used Only for Field Installation of AccuLERT
3 = 2 Pickup Coils and 2 Preamplifiers
T = 2 Pickup Coils Arranged for Use With AccuLERT
4 = 2 Pickup Coils and 1 Preamplifier</td></tr>
<tr><td rowspan="2">Position 4: Meter Size

1 = 1"
A = 1.5"
B = 2"
C = 3" (Low Flow)
D = 3"
E = 4"</td><td><u>Position 9: Testing/Linearity</u>
Non-metrological</td></tr>
<tr><td>Position 10: Compliance with Electrical and Other Standards*
Non-metrological</td></tr>
<tr><td>Position 5: Pressure Class
Non-metrological</td><td>Position 11: Specials
Non-metrological</td></tr>
</table>

***Note**: No testing was performed by CTEP to verify compliance with other standards organizations

FMC Smith Meter, Inc.
Loading Rack Turbine Wholesale Meter
Model: K2-XX-XX-X-X-X-X-X

Application: For use as a stationary wholesale meter for dispensing ethanol, gasoline and diesel fuel. The meter may be interfaced with approved and compatible equipment.

Sealing: There are no adjustable components on the meter and therefore sealing provisions are not required. Calibration data ("K" factor information) is stored and may be sealed in the loading rack indicating/controller system.

Operation: The K2 Series turbine type flow meters convert flow velocity into an electronic signal which is picked up and interpreted to represent volume throughput by associated electronic equipment.

Test Conditions: This Certificate supercedes Certificate of Conformance Number 93-053A4 and is issued to add Ethanol and a new meter size family. Testing of the meters was conducted at the manufacturer's facility using a test standard witnessed by an NTEP representative. The initial testing was conducted on a 1.5" Ball Bearing meter installed in the horizontal position and a 1.5" Ball Bearing meter installed in the vertical position. The meters were tested at four different flow rates using Ethanol. The permanence testing was performed after a throughput of 261 468 gallons of Ethanol.

Additional testing was conducted to add Ethanol to this certificate for the 3" & 4" meters. The initial testing was conducted on one 3" Journal bearing meter installed in the horizontal position. The meter was tested at four different flow rates using Ethanol. The permanence testing was performed after a throughput of 1,532,185 gallons of Ethanol.

Certificate of Conformance Number 93-053A4: This Certificate supersedes Certificate of Conformance Number 93-053A3 and is issued without additional testing to correct the omission of the "Application" section on the previous certificate. Previous test conditions are listed below for reference.

Certificate of Conformance Number 93-053A3: This Certificate superseded Certificate of Conformance Number 93-053A2 and is issued without additional testing to add the "Guardsman LS" versions of the 3" and 4" turbine meter and to change the model designation to reflect the "Guardsman LS" models based on information provided by the manufacturer and NTEP policy.

Certificate of Conformance Number 93-053A2: This Certificate superseded Certificate of Conformance Number 93-053A1 and was issued to include the Guardsman LJ-H Horizontal Journal Bearing Series -ANSI End Connections and Guardsman LJ-V Vertical Journal Bearing Series - ANSI End Connections (see Model Designation on Page 2). The emphasis of the evaluation was on the design, operation, performance and permanence of the meter calibration. The meters were initially evaluated for accuracy at 60 gpm, 330 gpm and 600 gpm flow rates across the flow range of the meter. Subsequent examinations were conducted after a throughput of over 1 200 000 gallons of kerosene.

Certificate of Conformance Number 93-053A1: This Certificate superseded Certificate of Conformance Number 93-053 and was issued to change the model designation format.

Certificate of Conformance Number 93-053: Initial tests were performed at the manufacturer's facility on the 3" and 4" meter mounted in both horizontal and vertical orientations. Testing was performed using test fluid and a master meter at five different flow rates across the flow range of the meters.

A 4" meter was installed in a field installation in a loading rack system and tested using gasoline at various flow rates across the flow range of the meter. Tests were performed initially and again after approximately 60 days and 3 413 975 gallons of product throughput. Additional tests were performed on a 4" meter installed to deliver diesel fuel in a loading rack system. Tests were conducted initially and again after approximately 240 days of in-service use after over 8 000 000 gallons of throughput.

The results of the evaluations indicate the device complies with applicable requirements of NIST Handbook 44.

FMC Smith Meter, Inc.
Loading Rack Turbine Wholesale Meter
Model: K2-XX-XX-X-X-X-X-X

Type Evaluation Criteria Used: NIST Handbook 44, 2003 Edition

Tested By: A. Schleicher (CA), R. Malloy (CA), T. G. Butcher (NIST) 93-053, R. Wotthlie (MD) 93-053A2, D. Reiswig (CA) (95-053A5)

Information Reviewed By: C. Cotsoradis (NIST) 93-053A1; G. Newrock (NIST), J. Williams (NIST) and R. Suiter (NIST) 93-053A3; L. T. Sebring (NIST) 93-053A4; S. Patoray (NCWM) 93-053A5, L. Bernetich (NCWM) 93-053A5