

FLOW LAB SERVICES



The best way to predict the future is to create it

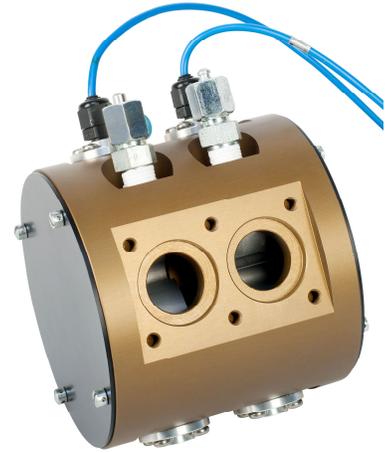
Introduction

In our continuous effort to provide our clients with the best possible solution in natural gas measurement for custody transfer applications, Flow Meter Group, Inc. has enriched its capabilities with the establishment of our "FlowLab" facility in Richmond, Texas.

In the lifecycle of every measurement device there comes a time where its performance is in question and it needs to be verified, specifically when such devices are used for custody transfer measurement. FMG's rotary and turbine meters are no exception.

We have developed a highly accurate compact test bench with very low uncertainty to provide you the guarantee that every meter that is tested on it, will receive the latest accurate verification report.

The FMTB-2500 test bench is the latest technology available for verification of a gas meter's accuracy with atmospheric air.



Reference Meter 2 & 3
9cfh to 350cfh (combined)

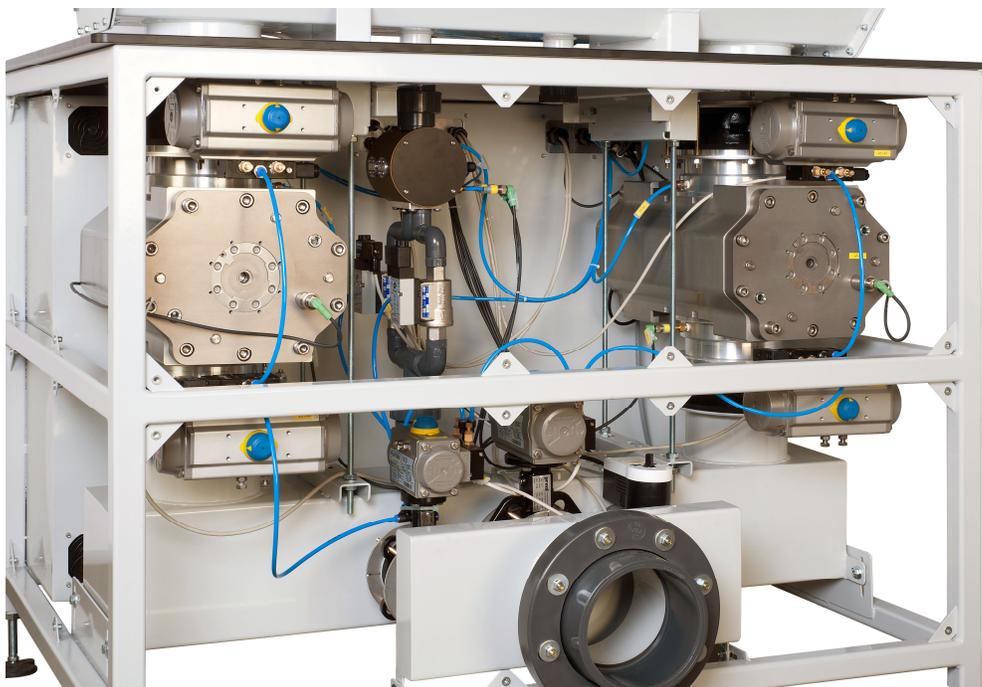


Zea. 38M DUAL Reference Meter 1 & 4
90cfh to 88,000cfh (combined)

With flow rates from as low as 9.0 ACFH to a maximum of 88.000 ACFH, the test facility is designed to cover all currently available ranges of rotary meters and turbine meters (up to 10 inches in size).

A sampling rate of 250 KHz guarantees fast collection of a large number of samples. This significantly reduces the turn-around time without compromising on accuracy. The test process is fully automated eliminating operator errors that could influence the results. With an uncertainty of 0.25%¹⁾ above 35 ACFH, the FMG Inc.

FlowLab offers un-matched precision in the field of meter verification. In addition, the FMTB-2500 is equipped with certified reference meters²⁾ traceable to international standards (NMI/VSL) and NIST in the United States. Not only are the reference meters certified, the installation as a whole has undergone certification by an internationally accepted laboratory for Weights & Measure, the "Van Swinden Laboratory (NMI)" in Delft, the Netherlands³⁾.



Notes: 1) Calculated according to EA-4/02 M: 2013 and ILAC-P14:01/2013.
2) & 3) Documentation is available on request.

Testing at the FlowLab

We currently offer testing, full service and repair of FMG rotary & turbine meters. All meters sent to our FlowLab must be equipped with at least one, uncorrected pulse output, preferable with a high frequency output. We only accept meters without ancillary installed, chart recorders, volume correctors and others must be removed unless these are integrated into the meter and cannot be removed. For example: TCI index heads or integrated P, T or PTZ correctors. However, an uncorrected pulse signal must be available.

Our FlowLab is currently authorized to carry out the following services/repairs on FMG flow meters:

- Installation of new, suitable index head for meter and application
- HF sensor test & replace
- Cartridge change
- Meter calibration (gear change to improve meter performance)
- Bearing change, back & front
- Bypass module test & replace
- Testing on FMTB-2500 between 9.0ACFH and 88.000 ACFH incl. test report
- Leak testing up to 100psi for meters up to 6 inch



Due to the advanced nature of our test bench, a typical 3 (three) point test can be performed within 15 to 20 minutes for meters that are equipped with a high frequency pulse output.

We at FMG Inc. are committed to deliver the services in a timely manner and strive to meet your schedule requirements. Please provide us with the necessary details for us to provide you with a proposal in accordance to your requirements.

Refer to our Work Process for repair and shipping instruction.

For meters from other manufacturers please consult us.



Calibration report
The best way to predict the future is to create it

Testbench: Flowmeter Group Testbench, FMG Inc Richmond, TX
Report number: FMTB-R000008837-2018
Report type: Re-Calibration
Report date: 2018-04-16
SER Number:
RMA Number:
Client: FMG, Inc.

Description: Re-Cert

Test meter

Manufacturer: FMG
Manufacturing year: 2014
Serial number: R000008837
Type: 250_FMR 160
Range: 230 - 23000 (FYH)

Index	Sensor type	(pulse/revolution)	(pulse/FY)
1	HF meter	1	22.042
2	HF meter	1	22.042
3	LF	1	0.01
4	LF	1	0.01

References

Index	Serial number	Range
1	R000004448	353.147 - 44143.3 (FYH)
2	R000004460L	6.70070 - 441.433 (FYH)

Test results

Index	Setpoint (FYH)	Real flow (FYH)	Error (%)	Uncertainty (%)
1	23000	22616.7	0.00	0.22
2	9790	9718.76	-0.17	0.21
3	230	226.704	-0.72	0.26

Calculated WME: -0.02 (%)

Graphic overview

04/15/2019 0.10.7.9 1/2



DECLARATION
Number G1186610
Page 1 of 3

Applicant: Flow Meter Group B.V.
 Meniststraat 3c
 7091 ZZ DIMPERLO
 The Netherlands

System under review: FMG Testbench for the calibration of gas flow meters at atmospheric air
 The calibration system is a full automated open loop design.
 The Meter under Test is placed at the air inlet (suction side) and the air is circulated back into the laboratory.

Date of review: 28 February until 1 March 2017

type of review: Conformity check on the design and on the used auxiliary equipment related to the base model. Validation of functionality, traceability sources (FMG owned Reference standards for ambient pressure, delta-pressure and temperature), calibration data and uncertainty calculation.
 The errors of the master meters are determined on the basis of the 'master meter method' at the premises of FMG, Dimperlo, the Netherlands. The traceability of the travelling reference meters of FMG and VSL are linked to the National Standards of VSL (NL) and PTB (D). For results, see table with references to certificates and calibration data on page 2.

Range	Flow range	Pressure range	Temperature range	Calibration medium
	0.25 to 2500 m ³ /h	950-1050 hPa	15-30 °C	Air

Result of review: VSL declares that:

1. the issued VSL certificates for the mastermeters (see table) are representative for the current characteristic error curves of the mastermeters;
2. the error and uncertainty of the error of the Meter under Test are calculated correctly by the system;
3. the traceability is supported by valid certificates of the used travelling reference meters (TRM's), the pressure reference standard and the temperature reference standard;
4. the Test bench under review is built in conformity with the base model which was scrutinized by VSL.

Deflt. 20 March 2017
 VSL B.V.


 S.K. Heugenoord RSC
 Senior Metrologist


 Dutch Metrology Institute

VSL B.V.
 T: +31 (0)40 260 0400
 F: +31 (0)20 508 5008
 E: vsl@vsl.nl
 www.vsl.nl

Certificates are issued under the condition that the test is not used for any other purpose than the one for which it was issued.

FMTB 2500

Experience Certainty at Your Own Premise



Contact Us

FMG Inc. 565 South Mason Rd., Suite #174,
Katy Texas 77450, USA
E: info@flowmetergroup.us, W: flowmetergroup.us



rev.000
Copyright © FMG Inc. 2019. All rights reserved
Subject to change without prior notice