



EXPERFLOW
MEASUREMENTS, INC.

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December 15, 2004

Flo-Pac LLC

Reference: Manual Balancing and Metering Valves

Gentlemen:

This letter is to confirm the outstanding performance of the Flo-Pac manual balancing valves that were tested at ABB, the flow calibration laboratory.

The performance of all tested prototypes (1/2" to 2") was to +/-3% of flow rates, and repeatability of +/- 0.25% of rates.

The low pressure loss coefficient, high recovery, and stable flow discharge coefficient are the main features of this new balancing and metering flow device.

The overall performance will meet and surpass ASHRAE systems recommendations.

Flow test loops and equipment are guaranteed to +/-0.25% of flow rates or better.

All test equipment and instruments are traceable to the National Institute of Standards & Technology (NIST).

Sam TAHA, P.Eng
Managing Director
Experflow Measurements, Inc.

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Tests and Calibration of Balancing/Metering Valves (Flo-Pac)

1 - Description:

Flo-Pac valves are fabricated with Venturi inlet and manual ball valve at the outlet discharge section. Memory stops and threaded ends are standard features.

Unions and sweat adapters are also available as required by the project specifications.

Sizes offered are from ½" to 2" in Brass for (Hi and Low flows).

From 2-1/2" to 10" are offered in carbon steel with butterfly valves at the discharge side.

2 - Calibration Lab, and Flow Tests:

The specially designed Venturi throat areas have achieved a very stable discharge coefficient (Cd), as tested at ABB Flow Calibration Laboratory. The fully equipped facility devoted to the calibration and testing of Flowmeters is one of the biggest Flow Calibration Laboratory of its kind in North America. Calibrations of the balancing and metering (Flo-Pac) valves were performed on water using transfer standards certified in-place against a primary standard, which is certified and traceable to The National Institute of Standards & Technology (NIST).

ABB's calibration tests of all sizes (½" to 2") has achieved an accuracy of +/-3% of flow rates, and very low pressure loss coefficients (Reduced operating costs in the overall system costs).

3 - Performance Accuracy and Repeatability:

Accuracy verification suitable for ISO 9000 certification requirements has provided an outstanding certified calibration accuracy for each valve/size to +/-3% of flow rates and a repeatability of +/-0.25% of readings.

Each tested valve was set at full open position as well as modulated ½ and 1/4 turn positions. Accuracy in all positions was the same with a standard deviation of +/-1.5%.

Testing equipments and reference meters (Mag Type) were guaranteed to +/-0.25% of flow rate or better.

Accuracy and repeatability are certified and traceable to NIST and in accordance to ISO 9001.

Test data reports are computer generated data checked and certified.

All tested flow valves were threaded type with flanged adapters ANSI class 150#.