

CALIBRATION CERTIFICATE # 503

Calibration date : 2011-02-23
Certificate issued : 2012-04-18

Company name
Company address
City, Province, Canada

Calibration of
Mass flow meter Micro Motion CMF050 S/N : ABCD4

QUALITY PROGRAM CONFORMANCE

All calibrations are performed in accordance with Polycontrols Laboratory Quality Assurance Manual and conformed to ISO/IEC 17025 ó 2005, ISO 9001 ó 2008 and/or other quality requirements defined in customers purchase descriptions.

TRACEABILITY

The traceability of mass flow is maintained through the fundamental units of mass (Kg) and time (sec) by gravimetric comparison. Mass and time are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST) or a calibration laboratory accredited and conformed to ISO/IEC 17025.

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and traceability to the International System of Units (SI) or to standards acceptable to the CLAS program. This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council of Canada (SCC). Neither CLAS nor SCC guarantee the accuracy of individual calibrations by accredited laboratories.

CALIBRATION AND MEASUREMENT CAPABILITY

References used for flow calibration have an uncertainty of $\pm 0.02\%$ of reading for a flow range include between 0.378 Kg/min and 41.58 Kg/min. Test and reference uncertainties are given with a coverage factor of 2 for a 95% level of confidence. The test uncertainty ratio (TUR) of this calibration is at least 4:1 unless otherwise stated.

CONDITION SUMMARY OF THE DEVICE UNDER TEST

Initial conditions	In good condition
Work done	Calibration of the instrument
Results	Initial readings in tolerance Final readings in tolerance
Remarks	

Metrologist

Laboratory Manager

Calibration certificate # 503

Serial Number:	ABCD4	Test stand:	6
Indicator S/N:	123456	Procedure:	POS-CAL-102
Indicator Model:	2400S	Calibration Date:	2011-02-23
Instrument ID:			

Standard equipment used for initial calibration

Description	Model	Serial #	Traceability	Due date
Gravimetric calibrator	Système 1	1129243216	P110301	2012-07-19
Gravimetric calibrator	Système 2	2932787	P110302	2012-07-22
Gravimetric calibrator	Système 3	2932787	P110303	2012-07-22
Frequency Counter	TF830	253057	287610	2012-10-19

Initial specifications of the device under test

Calibration conditions

Fluid	Water	Fluid	Water
Operation temperature	20 °C	Ambient temperature	21.5 °C
Operation pressure		Ambient pressure	1011 mbar
Process fluid density	1000 kg/m ³ @ 4 °C	Calibration fluid density	1000 kg/m ³ @ 4 °C
Process fluid viscosity	1.004 cSt @ 20 °C	Calibration fluid viscosity	1.004 cSt @ 20 °C
Sensor Capacity	7500 PPH	Orientation	Horizontal
Span	0-5000 PPH		
Output Signal	0-10000 Hz		
Supply	24 VDC		
Accuracy	±0.1 % O.R. OR ±0.36 PPH		

Initial readings

Device under test		Measured values		Calculated reference	Calculated error	Acceptable error	TUR
Hz	PPH	Temperature °C	Reference Kg/min				
302.303	151.1515	22.10	1.144636	151.4094	-0.2579	0.3600	>4
998.268	499.1340	22.10	3.776811	499.5865	-0.4525	0.4996	>4
1609.778	804.8890	22.09	6.087727	805.2684	-0.3794	0.8053	>4
3748.318	1874.1590	22.10	14.171581	1874.5792	-0.4202	1.8746	>4
7006.463	3503.2315	22.10	26.482613	3503.0498	0.1817	3.5030	>4
10010.915	5005.4575	22.08	37.839136	5005.2606	0.1969	5.0053	>4

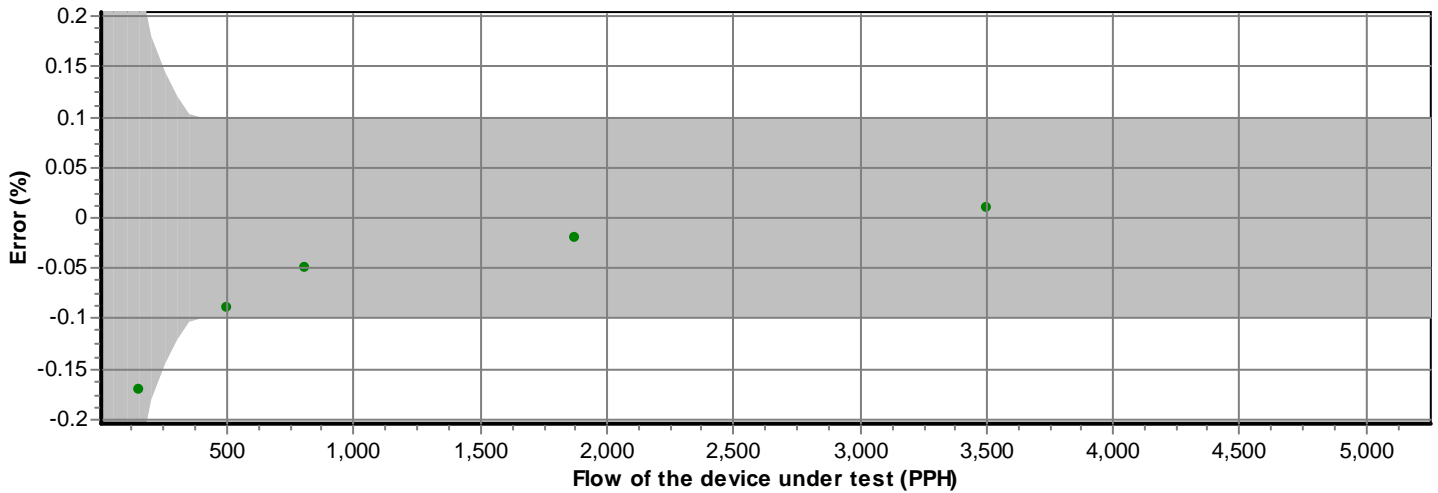
PC _____
Metrologist

Signature

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Indicator S/N:	123456	Procedure:	POS-CAL-102
Indicator Model:	2400S	Calibration Date:	2011-02-23
Instrument ID:			

Initial results



- The measurement result is within the specification limit when the measurement uncertainty is taken into account
- The measurement result is outside the specification limit when the measurement uncertainty is taken into account
- It is not possible to state compliance using a 95 % coverage probability for the expanded uncertainty although the measurement result is below the limit (ILAC G8)

PC _____
Metrologist

Signature

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Indicator S/N:	123456	Procedure:	POS-CAL-102
Indicator Model:	2400S	Calibration date:	2011-02-23
Instrument ID:			

Standard equipment used for final calibration

Description	Model	Serial #	Traceability	Due date
Gravimetric calibrator	Système 1	1129243216	P110301	2012-07-19
Gravimetric calibrator	Système 2	2932787	P110302	2012-07-22
Gravimetric calibrator	Système 3	2932787	P110303	2012-07-22
Frequency Counter	TF830	253057	287610	2012-10-19

Final specification of the device under test

Calibration conditions

Fluid	Water	Fluid	Water
Operation temperature	20 °C	Ambient temperature	21.5 °C
Operation pressure		Ambient pressure	998 mbar
Process fluid density	1000 kg/m ³ @ 4 °C	Calibration fluid density	1000 kg/m ³ @ 4 °C
Process fluid viscosity	1.004 cSt @ 20 °C	Calibration fluid viscosity	1.004 cSt @ 20 °C
Sensor capacity	7500 PPH	Orientation	Horizontal
Span	0-5000 PPH		
Output Signal	0-10000 Hz		
Supply			
Accuracy	±0.1 %O.R. OR ±0.36 PPH		

Final readings

Device under test		Measured values		Calculated reference	Calculated error	Acceptable error	TUR
Hz	PPH	Temperature °C	Reference Kg/min				
299.212	149.6060	22.09	1.132383	149.7886	-0.1826	0.3600	>4
1000.490	500.2450	22.11	3.783229	500.4355	-0.1905	0.5004	>4
1603.325	801.6625	21.98	6.060849	801.7130	-0.0505	0.8017	>4
3748.845	1874.4225	22.05	14.169262	1874.2724	0.1501	1.8743	>4
7017.559	3508.7795	22.04	26.521178	3508.1511	0.6284	3.5082	>4
10026.947	5013.4735	22.08	37.897694	5013.0065	0.4670	5.0130	>4

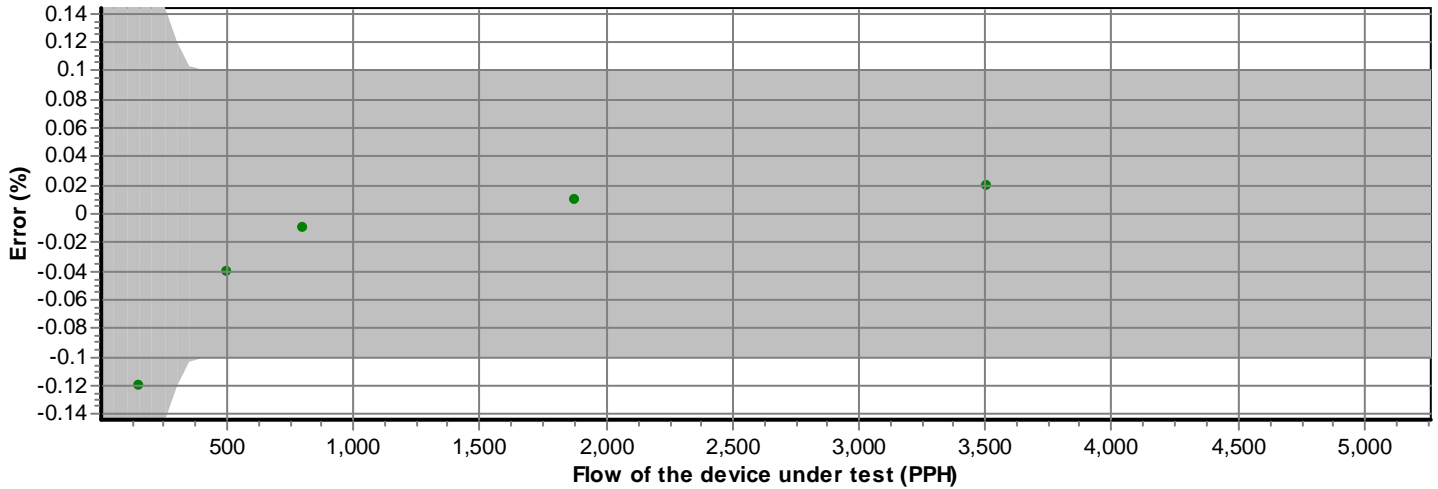
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Final results



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