



PROCESS PRODUCTS

Calibration Certificate

Pressure Transducer

Certificate Number: 10375M-2
Page 1 of 2 Pages
Issue Date: 2016-11-21
Final Calibration Date: 2016-11-21

Customer: Canadian Light Source Inc.
44 Innovation Blvd.
Saskatoon, SK
S7N 2V3

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.

The measurement uncertainties for this pressure range is the larger of +/- 0.05% of R or 5 Pa. The uncertainties are expanded using a coverage factor k=2 for a level of confidence of approximately 95%, assuming normal distribution.

CCR Calibration Procedure:	QA-118	Pressure Traceability:	DHI 1500198428
CLAS certification number:	93-01	Voltage Traceability:	Agilent 1-7763806764-1
SCC accreditation number:	103	Accreditation:	ISO 17025

Standard Equipment Used for this Calibration

Voltmeter:	Agilent 34401A	s/n:	MY45024551	Multimeter for voltage measurements
Vacuum:	KJL IG2200	s/n:	5949	Reference pressure measurement
Ref. Std.:	DHI RPM4	s/n:	665	Pressure monitor with 33 KPa range
Working Std.:	DHI RPM4	s/n:	566	Pressure monitor with 33 KPa range

Customer Unit Identification

Customer Unit:	627B11TEC1B	s/n:	001229383	Pressure transducer with 10 torr range
Customer specified ID:	TCM1601.1-R10-01			

Initial Condition Summary

Equipment Appearance:	OK
Sensor Contamination:	No visual appearance

Repair Action

Repair Done:	None required
Calibration Adjustment:	Yes

Notes

Calibrated by

Authorized by

Joel Hjescocks, Service Manager

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Customer Unit Specifications	
Accuracy Specification:	±0.12% of Rdg
Zero Temperature Coefficient:	20 ppm of FS/°C
Span Temperature Coefficient:	200 ppm of Rdg/°C
System Check:	n/a
Sensor Temperature:	45°C
Ref. Press. (torr):	Internal absolute

Calibration Conditions	
Ambient Temperature:	23°C ± 5°C
Calibration Gas:	nitrogen
Zero Pressure:	< 1E-6 torr
Customer Unit Display:	voltmeter
Sensor Tube Orientation:	port down

Initial As-Received Calibration Results

Standard		Customer Unit		Customer Unit Error		
Pressure (torr)	Voltage (Volts)	Pressure (torr)	Voltage (Volts)	Error (torr)	Error (Volts)	Error (% of R)
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
1.0000	1.0000	1.0123	1.0123	0.0123	0.0123	1.230%
2.0000	2.0000	2.0214	2.0214	0.0214	0.0214	1.070%
3.0040	3.0040	3.0355	3.0355	0.0315	0.0315	1.049%
4.0010	4.0010	4.0411	4.0411	0.0401	0.0401	1.002%
4.9970	4.9970	5.0475	5.0475	0.0505	0.0505	1.011%
6.0020	6.0020	6.0625	6.0625	0.0605	0.0605	1.008%
6.9980	6.9980	7.0673	7.0673	0.0693	0.0693	0.990%
7.9960	7.9960	8.0721	8.0721	0.0761	0.0761	0.952%
8.9960	8.9960	9.0792	9.0792	0.0832	0.0832	0.925%
10.0160	10.0160	10.1050	10.1050	0.0890	0.0890	0.889%

Final As-Shipped Calibration Results

Standard		Customer Unit		Customer Unit Error		
Pressure (torr)	Voltage (Volts)	Pressure (torr)	Voltage (Volts)	Error (torr)	Error (Volts)	Error (% of R)
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
1.0040	1.0040	1.0044	1.0044	0.0004	0.0004	0.040%
2.0080	2.0080	2.0081	2.0081	0.0001	0.0001	0.005%
3.0020	3.0020	3.0025	3.0025	0.0005	0.0005	0.017%
4.0040	4.0040	4.0041	4.0041	0.0001	0.0001	0.002%
5.0080	5.0080	5.0076	5.0076	-0.0004	-0.0004	-0.008%
6.0090	6.0090	6.0101	6.0101	0.0011	0.0011	0.018%
7.0130	7.0130	7.0143	7.0143	0.0013	0.0013	0.019%
8.0010	8.0010	8.0026	8.0026	0.0016	0.0016	0.020%
9.0010	9.0010	9.0012	9.0012	0.0002	0.0002	0.002%
10.0010	10.0010	10.0010	10.0010	0.0000	0.0000	0.000%



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Customer Unit Identification

Customer Unit:	627B11TQC1B	s/n:	001630156	Pressure transducer with 10 torr range
Customer specified ID:	n/a			

Initial Condition Summary

Equipment Appearance:	OK
Sensor Contamination:	No visual appearance

Repair Action

Repair Done:	None required
Calibration Adjustment:	Yes

Notes:

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Joel Hiscocks, Service Manager

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0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
1.0000	1.0000	1.0058	1.0058	0.0058	0.0058	0.580%
2.0000	2.0000	2.0097	2.0097	0.0097	0.0097	0.485%
3.0010	3.0010	3.0132	3.0132	0.0122	0.0122	0.407%
4.0010	4.0010	4.0162	4.0162	0.0152	0.0152	0.380%
5.0000	5.0000	5.0189	5.0189	0.0189	0.0189	0.378%
6.0010	6.0010	6.0221	6.0221	0.0211	0.0211	0.352%
6.9980	6.9980	7.0231	7.0231	0.0251	0.0251	0.359%
8.0020	8.0020	8.0299	8.0299	0.0279	0.0279	0.349%
9.0070	9.0070	9.0404	9.0404	0.0334	0.0334	0.371%
10.0120	10.0120	10.0498	10.0498	0.0378	0.0378	0.378%

Final As-Shipped Calibration Results

Standard		Customer Unit		Customer Unit Error		
Pressure (torr)	Voltage (Volts)	Pressure (torr)	Voltage (Volts)	Error (torr)	Error (Volts)	Error (% of R)
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.000%
2.0060	2.0060	2.0062	2.0062	0.0002	0.0002	0.010%
3.0040	3.0040	3.0024	3.0024	-0.0016	-0.0016	-0.053%
4.0060	4.0060	4.0023	4.0023	-0.0037	-0.0037	-0.092%
5.0030	5.0030	4.9992	4.9992	-0.0038	-0.0038	-0.076%
6.0030	6.0030	5.9984	5.9984	-0.0046	-0.0046	-0.077%
7.0150	7.0150	7.0106	7.0106	-0.0044	-0.0044	-0.063%
8.0060	8.0060	8.0012	8.0012	-0.0048	-0.0048	-0.060%
9.0070	9.0070	9.0038	9.0038	-0.0032	-0.0032	-0.036%
10.0030	10.0030	10.0024	10.0024	-0.0006	-0.0006	-0.006%