



# Calibration Services

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## **ADDITEL CORPORATION**

Additel Corporation is one of the leading worldwide providers of process calibration tools. We are dedicated to designing, manufacturing, and delivering the highest quality handheld test tools and portable calibrators for process and calibration industries.

Product quality and customer service along with innovative engineering have been our top priorities and will continue to be our guiding principles going forward. We are committed to customer satisfaction through quality products, competitive pricing, unmatched services/technical support and continued introduction of new and innovative products.

Phone: 714-998-6899    Fax: 714-998-6999    Email: [sales@additel.com](mailto:sales@additel.com)

## Our Service Philosophy

Additel Corporation was founded with a strong belief in providing the best possible customer service. Taking great pride in everything we do is second nature in our company culture. Calibration services are no exception. We work hard every day to uphold the integrity of our laboratory standards by closely adhering to our robust internal processes and procedures while working with our third-party accrediting body. Our customers have the utmost confidence in our **NVLAP accredited laboratory (Lab Code 600214-0) in Brea, CA USA.**

## Calibration Services

Additel offers calibration services for the entire Additel product line. Our laboratory uses primary-level piston gauge systems and high-performance controllers to provide you with low uncertainties and high confidence in the calibration of your devices.

- **Drywells (Including Process Capable Units)**
- **Gauges**
- **Modules**
- **Pressure Calibrators**
- **Pressure Controllers**
- **Loop Calibrators**



Pressure



Temperature



Electrical





## Calibration Scope

### Pressure

<i>Measured Parameter or Device Calibrated</i>	<i>Range</i>	<i>Expanded Uncertainty</i>
Absolute Pressure Source - Pneumatic	5 kPa to 360 kPa	0.0009 % + 1.02 Pa
	100 kPa to 7200 kPa	0.0017 % + 6.58 Pa
	2 MPa to 72 MPa	37 ppm + 164 Pa
Gauge Pressure Source – Pneumatic	0 Pa to 750 Pa	0.095 Pa
	>750 Pa to 7500 Pa	0.085 Pa
	5 kPa to 360 kPa	0.0007 % + 1.01 Pa
	100 kPa to 7200 kPa	0.002 % + 6.7 Pa
	2 MPa to 72 MPa	0.0037 % + 164 Pa
Gauge Pressure Source - Differential	-95 kPa to 10 kPa	0.013 % + 2.9 Pa
Gauge Pressure Source - Hydraulic	7 MPa to 275 MPa	0.0026 %+ 7660 Pa
	7 MPa to 20 MPa	3.100 kPa
	>20 MPa to 415 MPa	0.017 %



### Temperature

<i>Measured Parameter or Device Calibrated</i>	<i>Range</i>	<i>Expanded Uncertainty</i>
Drywell Calibrators	-40 °C to 0 °C	0.016 °C
	>0 °C to 50 °C	0.011 °C
	>50 °C to 155 °C	0.010 °C
	>155 °C to 300 °C	0.019 °C
	>300 °C to 450 °C	0.034 °C
	>450 °C to 550 °C	0.053 °C
	>550 °C to 660 °C	0.060 °C
RTD Simulation - Measure	-180 °C to 0 °C	0.039 °C
	>0 °C to 800 °C	0.240 °C
Thermocouple Simulation – Generate and Measure Type K	-200 °C to 0 °C	0.123 °C
	> 0 °C to 660 °C	0.078 °C
	> 660 °C to 1300 °C	0.100 °C
Triple Point of Water	0.01 °C	7.9 mK

## Calibration Scope

### Electrical Measurement

<i>Measured Parameter or Device Calibrated</i>	<i>Range</i>	<i>Expanded Uncertainty</i>
DC Resistance – Generate, Fixed Instrument Based	1 $\Omega$	0.016 $^{\circ}\text{C}$
	1.9 $\Omega$	0.011 $^{\circ}\text{C}$
	10 $\Omega$	0.010 $^{\circ}\text{C}$
	19 $\Omega$	0.019 $^{\circ}\text{C}$
	100 $\Omega$	0.034 $^{\circ}\text{C}$
	190 $\Omega$	0.053 $^{\circ}\text{C}$
	1 k $\Omega$	0.060 $^{\circ}\text{C}$
	1.9 k $\Omega$	0.039 $^{\circ}\text{C}$
DC Resistance – Generate, Variable Instrument Based	10 $\Omega$ , 400 $\Omega$ Range	12 m $\Omega$
	100 $\Omega$ , 400 $\Omega$ Range	12 m $\Omega$
	400 $\Omega$ , 400 $\Omega$ Range	10 m $\Omega$
	10 $\Omega$ , 4k $\Omega$ Range	230 m $\Omega$
	100 $\Omega$ , 4k $\Omega$ Range	230 m $\Omega$
	400 $\Omega$ , 4k $\Omega$ Range	231 m $\Omega$
DC Resistance - Measure	0 $\Omega$ to 10 $\Omega$	11.57 $\mu\Omega/\Omega$ + 50 $\mu\Omega$
	>10 $\Omega$ to 100 $\Omega$	9.2 $\mu\Omega/\Omega$ + 500 $\mu\Omega$
	>100 $\Omega$ to 1 k $\Omega$	8.6 $\mu\Omega/\Omega$ + 500 $\mu\Omega$
	>1k $\Omega$ to 10 k $\Omega$	6.86 $\mu\Omega/\Omega$ + 5 m $\Omega$
DC Current - Generate	0 mA to 220 $\mu\text{A}$	40.46 $\mu\text{A}/\text{A}$ + 6 nA
	> 220 $\mu\text{A}$ to 2.2 mA	45.20 $\mu\text{A}/\text{A}$ + 7 nA
	> 2.2 mA to 22 mA	45.20 $\mu\text{A}/\text{A}$ + 40 nA
	> 22 mA to 220 mA	44.16 $\mu\text{A}/\text{A}$ + 0.7 $\mu\text{A}$
	> 220 mA to 2.2 A	93.04 $\mu\text{A}/\text{A}$ + 12 $\mu\text{A}$
DC Current – Measure	0 to 100 $\mu\text{A}$	23.77 $\mu\text{A}/\text{A}$ + 2.1 nA
	> 100 $\mu\text{A}$ to 1.0 mA	21.53 $\mu\text{A}/\text{A}$ + 6 nA
	> 1.0 mA to 10 mA	21.54 $\mu\text{A}/\text{A}$ + 60 nA
	> 10 mA to 100 mA	26.33 $\mu\text{A}/\text{A}$ + 0.6 $\mu\text{A}$
	> 100 mA to 1 A	86.75 $\mu\text{A}/\text{A}$ + 12 $\mu\text{A}$
DC Voltage - Generate	0 mV to 220 mV	9.19 $\mu\text{V}/\text{V}$ + 0.4 $\mu\text{V}$
	>220 mV to 2.2 V	5.25 $\mu\text{V}/\text{V}$ + 0.7 $\mu\text{V}$
	>2.2 V to 11 V	3.47 $\mu\text{V}/\text{V}$ + 2.5 $\mu\text{V}$
	>11 V to 22 V	3.47 $\mu\text{V}/\text{V}$ + 4 $\mu\text{V}$
	>22V to 220 V	4.92 $\mu\text{V}/\text{V}$ + 40 $\mu\text{V}$
	>220 to 1100 V	6.38 $\mu\text{V}/\text{V}$ + 400 $\mu\text{V}$
DC Voltage - Measure	0 mV to 100 mV	7.9 $\mu\text{V}/\text{V}$ + 0.4 $\mu\text{V}$
	>100 mV to 1 V	3.9 $\mu\text{V}/\text{V}$ + 0.4 $\mu\text{V}$
	>1 V to 10 V	3.83 $\mu\text{V}/\text{V}$ + 0.6 $\mu\text{V}$
	>10 V to 100 V	24.85 $\mu\text{V}/\text{V}$ + 40 $\mu\text{V}$
	>100V to 1000 V	14.63 $\mu\text{V}/\text{V}$ + 110 $\mu\text{V}$
Frequency - Generate	>100 Hz to 50 kHz	1 uHz/Hz + 2 nHz
Frequency - Measure	>100 Hz to 50 kHz	1 uHz/Hz + 2 nHz



## Sample Certificate



## Certificate of Calibration



<b>Model:</b>	ADT681-05-GP1K-BAR-N	<b>Report Number:</b>	N19011013
<b>Description:</b>	Additel 681	<b>Calibration Date:</b>	1/10/2019
<b>Serial Number:</b>	211H18160048	<b>Due Date:</b>	1/9/2020
<b>Pressure Range:</b>	(0 to 70)bar	<b>Temperature:</b>	21.8°C
<b>Accuracy(%FS):</b>	0.05%FS	<b>Humidity:</b>	41% RH
<b>Status:</b>	New	<b>Certificate Date:</b>	1/10/2019
<b>Procedure:</b>	ADT681;Lab3.0;ADT681V03.07	<b>Data Type:</b>	As-Left
		<b>Data Results:</b>	In Tolerance

<b>Customer:</b>	<b>Location of Calibration:</b>
	Additel Corporation
	2900 Saturn Street #B
	Brea CA 92821
	United States

Reference Standards used in this calibration are traceable to the SI Units through National Institute of Standards and Technology (NIST) or other recognized National Metrology Institutes (NMI's). This calibration is compliant to ISO/IEC 17025:2017 and ANSI/NCSL Z540-1:R2002.

By default, Additel reports the measurement result and its associated measurement uncertainty. When the measurement result is outside Additel's published specifications, it is indicated by a fail condition without taking the associated measurement uncertainty into consideration. Alternatively, if a compliance decision is desired taking the measurement uncertainty into account, Additel utilizes the ANSI Z540.3 Handbook Method 6 to make statements of conformity to specifications.

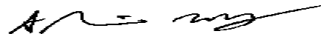
The results on this calibration report apply only to the item (s) calibrated or tested. Uncertainties of the measurements are based upon a coverage factor of k=2 providing an approximate 95% confidence level. The recommended calibration due date is included in the report only if it is specified by the customer.


This report shall not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. government. This report shall not be reproduced, except in full without written approval of Additel Corporation.

## Standards Used

Model	Description	Serial Number	Cal Date	Due Date
ADT160A-AP1KR-MPA-M	Additel Quartz Pressure Module	005180B0012	10/18/2018	1/18/2019
ADT780-3K	Additel Pressure Controller	82215020007	12/13/2018	6/13/2019

## Comments:

Performed By:   
Alvin Wong

Approved By:   
Eric Chavier

## Sample Certificate Continued

Report Number: N19011013

### Test Results

TestPoint	Reference	DUT	Difference	Specification	Uncertainty	Condition
bar	bar	bar	bar	bar	bar	
0.000	0.0000	0.000	-0.0002	±0.0350	1.8E-03	pass
17.500	17.5001	17.498	-0.0017	±0.0350	1.8E-03	pass
35.000	35.0000	34.997	-0.0026	±0.0350	3.0E-03	pass
52.500	52.5000	52.496	-0.0039	±0.0350	4.5E-03	pass
70.000	70.0000	69.995	-0.0045	±0.0350	5.9E-03	pass
52.500	52.4999	52.496	-0.0039	±0.0350	4.5E-03	pass
35.000	35.0000	34.999	-0.0015	±0.0350	3.0E-03	pass
17.500	17.4999	17.500	0.0002	±0.0350	1.8E-03	pass
0.000	0.0001	0.001	0.0010	±0.0350	1.8E-03	pass

## Repair Services

If needed, Additel repair services are performed at our headquarters in Brea, CA USA. All repair work is covered by a (90) day warranty, including parts and labor. Please contact our friendly service team by calling 1-714-998-6899 should your Additel product require calibration or repair services. We would be happy to help!

## Warranty

Additel products come standard with a (1) or (3) year warranty offering protection from product defects in workmanship and materials from the date of shipment.





# Additel

■ Pressure   ■ Temperature   ■ Electrical

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