



# CERTIFICATE OF ACCREDITATION

## ANSI-ASQ National Accreditation Board

500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

### **A&P Calibrations, Inc.**

**6920 Koll Center Parkway, Suite 223**

**Pleasanton, CA 94566**

has been assessed by ANAB  
and meets the requirements of international standard

## **ISO/IEC 17025:2005**

and national standard

## **ANSI/NCSL Z540-1-1994 (R2002)**

while demonstrating technical competence in the field of

## **CALIBRATION**

Refer to the accompanying Scope of Accreditation for information regarding the types of calibrations to which this accreditation applies.

AC-1540

Certificate Number

  
ANAB Approval

Certificate Valid: 05/26/2017-04/28/2019  
Version No. 004 Issued: 05/26/2017



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005 AND ANSI/NCSL Z540-1-1994 (R2002)

A&P Calibrations, Inc.
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CALIBRATION

Valid to: April 28, 2019

Certificate Number: AC-1540

Electrical – DC/Low Frequency

Table with 4 columns: Parameter / Equipment, Range, Expanded Uncertainty of Measurement (+/-), Reference Standard, Method and/or Equipment. Rows include DC Voltage - Source, DC Voltage - Measure, DC Current - Source, and DC Current - Measure.



Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
AC Voltage - Source & Measure <sup>1</sup>  10 Hz to 500 kHz 10 Hz to 500 kHz 10 Hz to 500 kHz 10 Hz to 100 kHz 10 Hz to 100 kHz 45 Hz to 10 kHz	Up to 33 mV (33 to 330) mV 330 mV to 3.3 V (3.3 to 33) V (33 to 330) V 330 V to 1 kV	1.4 mV 13 mV 0.12 V 0.25 V 0.81 V 1.2 V	Fluke 5520A with Agilent 3458A
AC Current - Source & Measure <sup>1</sup>  10 Hz to 30 kHz 10 Hz to 30 kHz 10 Hz to 30 kHz 10 Hz to 13 kHz 10 Hz to 10 kHz	(30 to 330) $\mu$ A 330 $\mu$ A to 3.3 mA (3.3 to 33) mA (33 to 330) mA 330 mA to 1 A	5.8 $\mu$ A 47 $\mu$ A 0.28 mA 8.0 mA 39 mA	Fluke 5520A with Agilent 3458A
AC Current - Source & Measure <sup>1</sup>  (10 to 60) Hz (45 to 60) Hz	(1 to 3) A (3 to 11) A	0.22 A 0.28 A	Fluke 5520A with Fluke 321 AC Clamp and 50 Turn Coil
Resistance – Source Fixed Point <sup>1</sup>	10 M $\Omega$	1.60 k $\Omega$	Fluke 5520A, Megger CB101, AEMC BR07
Electrical Simulation of Thermocouples - Source & Measure <sup>1</sup>  Type J Type K Type T	(-196 to 1 000) $^{\circ}$ C (-196 to 1 000) $^{\circ}$ C (-100 to 400) $^{\circ}$ C	0.44 $^{\circ}$ C 0.37 $^{\circ}$ C 0.63 $^{\circ}$ C	Fluke 5520A



Mass

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Pressure <sup>1</sup>	(0.1 to 300) psig (300 to 1 000) psig	0.015 % + 0.0086 psig 0.015 % + 0.012 psig	Ruska Fluke 7252i Dual Channel Pressure Controller/Calibrator
Pipettes and Other Volumetric Devices <sup>1</sup>	2 µl 5 µl 10 µL 20 µL 50 µL 100 µL 200 µL 300 µL 1 mL 2 mL 5 mL 10 mL 20 mL	0.04 µL 0.06 µL 0.06 µL 0.08 µL 0.08 µL 0.22 µL 0.29 µL 0.58 µL 2.9 µL 4.1 µL 8.3 µL 11 µL 32 µL	Volumetric and Gravimetric Calibration Referenced to Mass Balances, ANSI/ASTM E617 Mass Standards, and Pipette Checker Software
Balances <sup>1</sup>	Up to 10 mg (10 to 100) mg 100 mg to 1 g (1 to 10) g (10 to 30) g (30 to 40) g (40 to 60) g	0.19 mg 0.19 mg 0.19 mg 0.38 mg 0.19 mg 0.19 mg 0.19 mg	Class 1 Weights

Thermodynamic

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Temperature <sup>1</sup>	(-196 to 400) °C	0.07 °C	Hart Scientific 5628 SPRT, Hart Scientific 1590 Super-Thermometer, Hart 2562 and 2565 Black Stack, Scanner Module, PRT Hart Scientific 1521 Meter Triple Point

**Time and Frequency**

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Frequency - Measure <sup>1,2</sup>	1 Hz to 20 MHz	$6 \times 10^{-5}$ Hz/Hz	Agilent 5316A/B Counters

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ( $k=2$ ), corresponding to a confidence level of approximately 95%.

Notes:

1. On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope
2.  $f$  represents the measured frequency value.
3. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-1540.



Vice President

