

# Calibration Certificate

Certificate Number 2021000630

**Customer:**  
Municipalidad de Recoleta  
Avda Recoleta 274  
Santiago, Chile

<b>Model Number</b>	CAL200	<b>Procedure Number</b>	D0001.8386
<b>Serial Number</b>	18514	<b>Technician</b>	Scott Montgomery
<b>Test Results</b>	<b>Pass</b>	<b>Calibration Date</b>	19 Jan 2021
<b>Initial Condition</b>	As Manufactured	<b>Calibration Due</b>	19 Jan 2023
<b>Description</b>	Larson Davis CAL200 Acoustic Calibrator	<b>Temperature</b>	23 °C ± 0.3 °C
		<b>Humidity</b>	31 %RH ± 3 %RH
		<b>Static Pressure</b>	101.3 kPa ± 1 kPa

**Evaluation Method** The data is acquired by the insert voltage calibration method using the reference microphone's open circuit sensitivity. Data reported in dB re 20 µPa.

**Compliance Standards** Compliant to Manufacturer Specifications per D0001.8190 and the following standards:  
IEC 60942:2017 ANSI S1.40-2006

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2017. **Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.**

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

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Standards Used			
Description	Cal Date	Cal Due	Cal Standard
Agilent 34401A DMM	08/04/2020	08/04/2021	001021
Larson Davis Model 2900 Real Time Analyzer	04/02/2020	04/02/2021	001051
Microphone Calibration System	03/03/2020	03/03/2021	005446
1/2" Preamplifier	08/27/2020	08/27/2021	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/06/2020	08/06/2021	006507
1/2 inch Microphone - RI - 200V	06/04/2020	06/04/2021	006510
Pressure Transducer	07/17/2020	07/17/2021	007368

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**Output Level**

Nominal Level [dB]	Pressure [kPa]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
114	101.2	114.00	113.80	114.20	0.14	Pass
94	101.3	94.01	93.80	94.20	0.15	Pass

-- End of measurement results--

**Frequency**

Nominal Level [dB]	Pressure [kPa]	Test Result [Hz]	Lower limit [Hz]	Upper limit [Hz]	Expanded Uncertainty [Hz]	Result
114	101.2	1,000.04	990.00	1,010.00	0.20	Pass
94	101.3	1,000.04	990.00	1,010.00	0.20	Pass

-- End of measurement results--

**Total Harmonic Distortion + Noise (THD+N)**

Nominal Level [dB]	Pressure [kPa]	Test Result [%]	Lower limit [%]	Upper limit [%]	Expanded Uncertainty [%]	Result
114	101.2	0.30	0.00	2.00	0.25 ‡	Pass
94	101.3	0.41	0.00	2.00	0.25 ‡	Pass

-- End of measurement results--

**Level Change Over Pressure**

Tested at: 114 dB, 23 °C, 32 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
108.0	108.0	-0.03	-0.30	0.30	0.04 ‡	Pass
101.3	101.5	0.00	-0.30	0.30	0.04 ‡	Pass
92.0	92.4	0.02	-0.30	0.30	0.04 ‡	Pass
83.0	82.9	0.00	-0.30	0.30	0.04 ‡	Pass
74.0	73.7	-0.08	-0.30	0.30	0.04 ‡	Pass
65.0	65.4	-0.21	-0.30	0.30	0.04 ‡	Pass

-- End of measurement results--

**Frequency Change Over Pressure**

Tested at: 114 dB, 23 °C, 32 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [Hz]	Lower limit [Hz]	Upper limit [Hz]	Expanded Uncertainty [Hz]	Result
108.0	108.0	0.00	-10.00	10.00	0.20 ‡	Pass
101.3	101.5	0.00	-10.00	10.00	0.20 ‡	Pass
92.0	92.4	0.00	-10.00	10.00	0.20 ‡	Pass
83.0	82.9	-0.01	-10.00	10.00	0.20 ‡	Pass
74.0	73.7	-0.01	-10.00	10.00	0.20 ‡	Pass
65.0	65.4	-0.02	-10.00	10.00	0.20 ‡	Pass

-- End of measurement results--

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### Total Harmonic Distortion + Noise (THD+N) Over Pressure

Tested at: 114 dB, 23 °C, 32 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [%]	Lower limit [%]	Upper limit [%]	Expanded Uncertainty [%]	Result
108.0	108.0	0.29	0.00	2.00	0.25 ‡	Pass
101.3	101.5	0.29	0.00	2.00	0.25 ‡	Pass
92.0	92.4	0.29	0.00	2.00	0.25 ‡	Pass
83.0	82.9	0.29	0.00	2.00	0.25 ‡	Pass
74.0	73.7	0.30	0.00	2.00	0.25 ‡	Pass
65.0	65.4	0.31	0.00	2.00	0.25 ‡	Pass

-- End of measurement results--

Signatory: Scott Montgomery

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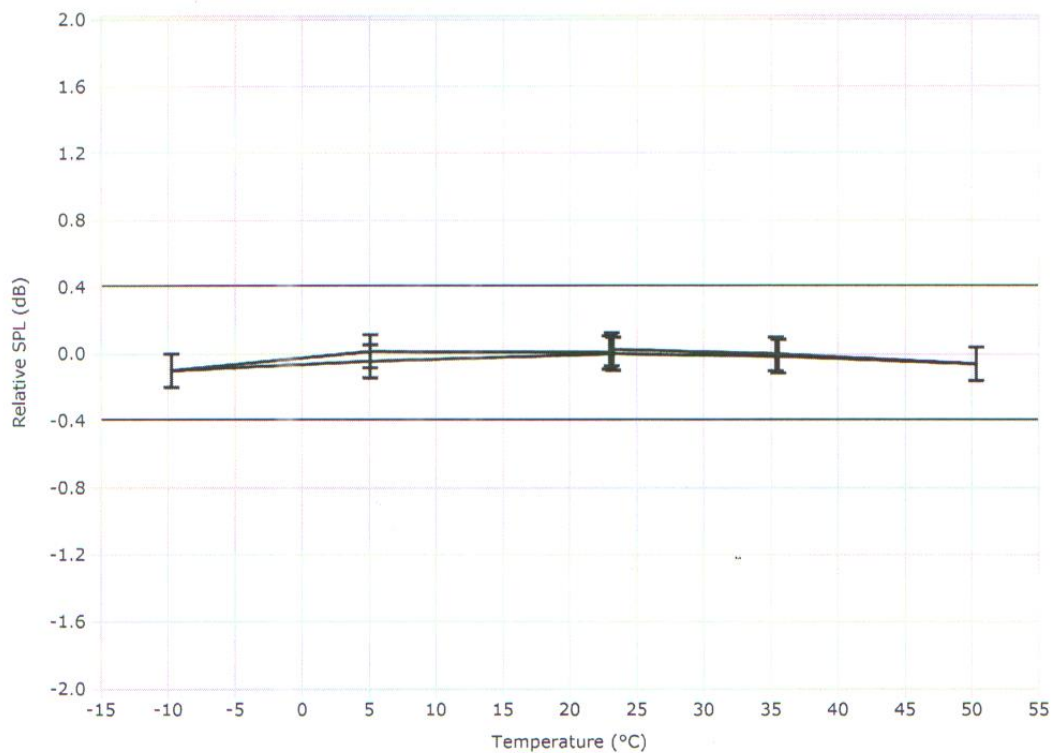


## Model CAL200 Relative SPL vs. Temperature

Larson Davis Model CAL200 Serial Number: 18514

Model CAL200 Relative SPL vs. Temperature at 50% RH.  
A 2559 Mic (SN: 2990) with a PRM901 Preamp (SN: 0214), station 15 was used to check the levels.

Test Date: 10 Dec 2020 7:17:56 AM



0.1dB expanded uncertainty at ~95% confidence level (k=2)

Sequence File: CAL250w200.SEQ

Test Location: Larson Davis, a division of PCB Piezotronics, Inc.  
1681 West 820 North, Provo, Utah 84601  
Tel: 716 684-0001 www.LarsonDavis.com



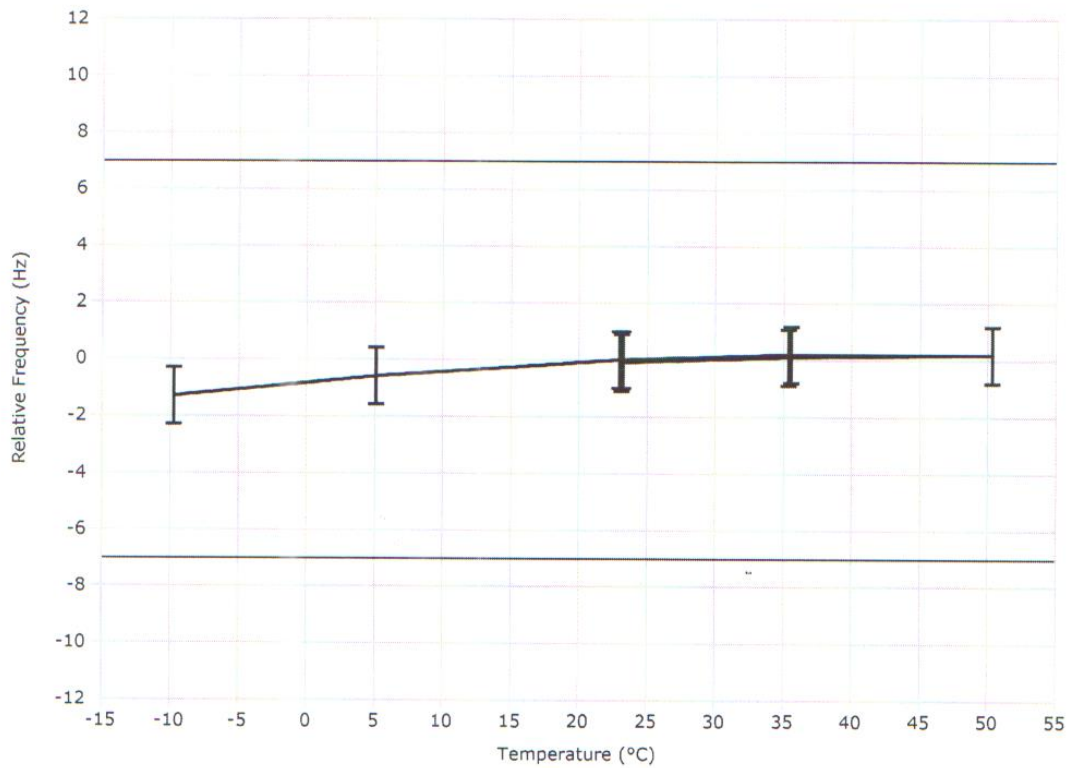


### Model CAL200 Relative Frequency vs. Temperature

Larson Davis Model CAL200 Serial Number: 18514

Model CAL200 Relative Frequency vs. Temperature at 50% RH.  
A 2559 Mic (SN: 2990) with a PRM901 Preamp (SN: 0214), station 15 was used to check the levels.

Test Date: 10 Dec 2020 7:17:56 AM



1.0 Hz expanded uncertainty at ~95% confidence level (k=2)

Sequence File: CAL250w200.SEQ

Test Location: Larson Davis, a division of PCB Piezotronics, Inc.  
1681 West 820 North, Provo, Utah 84601  
Tel: 716 684-0001 [www.LarsonDavis.com](http://www.LarsonDavis.com)