

REPORTE TÉCNICO DECRETO SUPREMO N°38/11 DEL MINISTERIO DEL MEDIO AMBIENTE
Norma de Emisión de Ruidos Generados por Fuentes que Indica

FICHA DE EVALUACIÓN DE NIVELES DE RUIDO					
IDENTIFICACIÓN DE LA FUENTE EMISORA DE RUIDO					
Nombre Fuente Emisora	RESTAURANTE MCDONALD'S BILBAO - PROVIDENCIA				
Nombre o Razón Social	ARCOS DORADOS RESTAURANTES DE CHILE LIMITADA				
RUT	96620260-2				
Dirección	Avenida Francisco Bilbao 103	Comuna	Providencia		
Tipo de Fuente	Actividad Comercial	Subtipo Fuente	Restaurant		
RESUMEN DE EVALUACIÓN					
Punto de medición	NPC [dBA]	Zona D.S. 38/11 MMA	Período (Diurno/Nocturno)	Límite [dBA]	Estado (Supera/No supera)
1 - 1	63	Zona III	Diurno	65	No Supera
OBSERVACIONES DEL PROCESO DE MEDICIÓN					
Sin observaciones					
IDENTIFICACIÓN DEL INFORME TÉCNICO					
Fecha de emisión	29/04/2024				
Nombre encargado medición	Omar Alvear				
Institución o empresa	SMA				

REPORTE TÉCNICO DECRETO SUPREMO N°38/11 DEL MINISTERIO DEL MEDIO AMBIENTE
Norma de Emisión de Ruidos Generados por Fuentes que Indica

FICHA DE GEORREFERENCIACIÓN DE MEDICIÓN DE RUIDO



LEYENDA DE CROQUIS O IMAGEN UTILIZADA

DATUM	WGS84	Huso	19S	
Fuente	Símbolo	Nombre	Coordenadas	
	FE	ARCOS DORADOS RESTAURANTES DE CHILE LIMITADA	N	6298432
			E	348467

RECEPTORES

Símbolo	Nombre	Coordenadas	
R1	1	N	6298486
		E	348476
RFA	Ruido de Fondo A	N	6298514
		E	348501

REPORTE TÉCNICO DECRETO SUPREMO N°38/11 DEL MINISTERIO DEL MEDIO AMBIENTE
Norma de Emisión de Ruidos Generados por Fuentes que Indica

FICHA DE INFORMACIÓN DE MEDICIÓN DE RUIDO

IDENTIFICACIÓN DE RECEPTORES

Nombre o Razón Social	1		
Dirección	Seminario 143	Comuna	Providencia
Zona IPT	UpR y ECr	Homologación	Zona III
Descripción del Receptor	Departamento		

REPORTE TÉCNICO DECRETO SUPREMO N°38/11 DEL MINISTERIO DEL MEDIO AMBIENTE **Norma de Emisión de Ruidos Generados por Fuentes que Indica**

FICHA DE MEDICIÓN DE NIVELES DE RUIDO

Nombre o Razón Social Receptor	1	Número Medición	1
Fecha de medición	31/01/2024	Período de medición	Diurno
Hora inicio de medición	09:54	Hora término de medición	11:13
Condición de medición	Interna	Condición ventana	Abierta
Descripción lugar de medición	Habitación		
Identificación del ruido de fondo	Tránsito vehicular		

INSTRUMENTAL DE MEDICIÓN

CARACTERÍSTICA	SONÓMETRO	CALIBRADOR ACÚSTICO
Marca	LARSON DAVIS	LARSON DAVIS
Modelo	LXT1	CAL200
N° de serie	0007263	20915
Fecha certificado de calibración	04/01/2023	14/12/2022
Código certificado de calibración	2023000076-2023000083	2022015829

FICHA DE EVALUACIÓN DE NIVELES DE RUIDO

Descriptor	MEDICIÓN 1			MEDICIÓN 2			MEDICIÓN 3		
N° de medición	1	2	3	4	5	6	7	8	9
NPS _{eq}	60.0	59.2	58.0	61.1	60.8	61.4	60.4	61.2	59.4
NPS _{máx}	63.1	61.2	62.9	65.0	63.2	63.2	62.7	64.3	62.4
NPS _{mín}	54.5	56.6	54.8	56.5	57.1	56.8	58.0	59.1	57.0

REGISTRO RUIDO DE FONDO

Afecta medición	Si	Fecha	31/01/2024	Hora	05:14
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	5'	10'	15'	20'	25'	30'	Medición realizada en punto receptor		
NPS _{eq}	56	56	-	-	-	-	No		

COORDENADAS DE MEDICIÓN DE RUIDO DE FONDO

DATUM	WGS84	HUSO	19S
Coordenada Norte	6298514	Coordenada Este	348501

RESULTADO DE MEDICIÓN

RUIDO DE FONDO	NPC
61	63

OBSERVACIONES

Calibration Certificate

Certificate Number 2023000076

Customer:

Sistemas De Instrumentacion

Concha Y Toro # 65

Santiago Centro

Santiago, , Chile

Model Number LxT1

Serial Number 0007263

Test Results Pass

Initial Condition As Manufactured

Description SoundTrack LxT Class 1
Class 1 Sound Level Meter
Firmware Revision: 2.404

Procedure Number D0001.8378

Technician Jacob Cannon

Calibration Date 4 Jan 2023

Calibration Due 4 Jan 2025

Temperature 23.56 °C ± 0.25 °C

Humidity 49.4 %RH ± 2.0 %RH

Static Pressure 86.52 kPa ± 0.13 kPa

Evaluation Method Tested electrically using Larson Davis PRMLxT1 S/N 077607 and a 12.0 pF capacitor to simulate microphone capacitance. Data reported in dB re 20 µPa assuming a microphone sensitivity of 50.0 mV/Pa.

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8384:

IEC 60651:2001 Type 1

IEC 60804:2000 Type 1

IEC 61252:2002

IEC 61672:2013 Class 1

ANSI S1.4-2014 Class 1

ANSI S1.4 (R2006) Type 1

ANSI S1.25 (R2007)

ANSI S1.43 (R2007) Type 1

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 International System of Units (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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Correction data from Larson Davis LxT Manual for SoundTrack LxT & SoundExpert Lxt, I770.01 Rev O Supporting Firmware Version 4.0.5, 2019-09-10

Calibration Check Frequency: 1000 Hz; Reference Sound Pressure Level: 114 dB re 20 µPa

Periodic tests were performed in accordance with procedures from IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part3.

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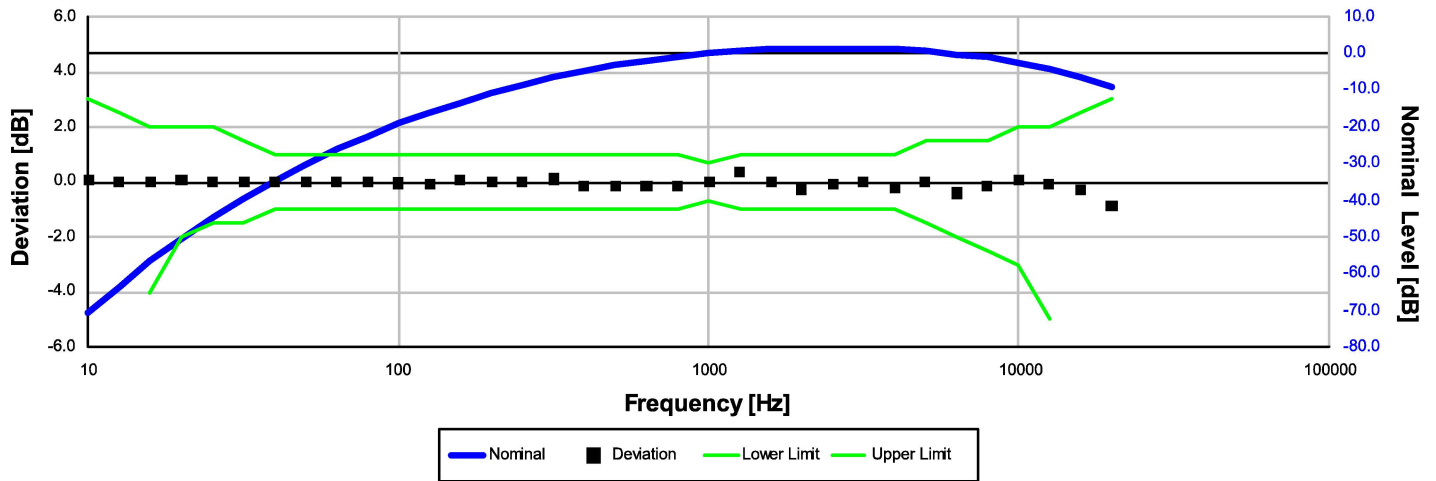
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Pattern approval for IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 successfully completed by Physikalisch-Technische Bundesanstalt (PTB) on 2007-10-09 reference number PTB-1.72-4034218.

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part 3, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organization responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013 / ANSI/ASA S1.4-2014/Part 2, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1; the sound level meter submitted for testing conforms to the class 1 specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1.

Standards Used			
Description	Cal Date	Cal Due	Cal Standard
Hart Scientific 2626-H Temperature Probe	2021-08-25	2023-02-25	006798
SRS DS360 Ultra Low Distortion Generator	2022-03-29	2023-03-29	007635

A-weight Filter Response



Electrical signal test of frequency weighting performed according to IEC 61672-3:2013 13 and ANSI S1.4-2014 Part 3: 13 for compliance to IEC 61672-1:2013 5.5; IEC 60651:2001 6.1 and 9.2.2; IEC 60804:2000 5; ANSI S1.4:1983 (R2006) 5.1 and 8.2.1; ANSI S1.4-2014 Part 1: 5.5

Frequency [Hz]	Test Result [dB]	Deviation [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
10.00	-70.33	0.07	-inf	3.00	0.25	Pass
12.59	-63.38	0.02	-inf	2.50	0.25	Pass
15.85	-56.71	-0.01	-4.00	2.00	0.25	Pass
19.95	-50.41	0.09	-2.00	2.00	0.25	Pass
25.12	-44.69	0.01	-1.50	2.00	0.25	Pass
31.62	-39.41	-0.01	-1.50	1.50	0.25	Pass
39.81	-34.62	-0.02	-1.00	1.00	0.25	Pass
50.12	-30.21	-0.01	-1.00	1.00	0.25	Pass
63.10	-26.20	0.00	-1.00	1.00	0.25	Pass
79.43	-22.47	0.03	-1.00	1.00	0.25	Pass
100.00	-19.13	-0.03	-1.00	1.00	0.25	Pass
125.89	-16.16	-0.06	-1.00	1.00	0.25	Pass
158.49	-13.33	0.07	-1.00	1.00	0.25	Pass
199.53	-10.87	0.03	-1.00	1.00	0.25	Pass
251.19	-8.62	-0.02	-1.00	1.00	0.25	Pass
316.23	-6.48	0.12	-1.00	1.00	0.25	Pass
398.11	-4.91	-0.11	-1.00	1.00	0.25	Pass
501.19	-3.34	-0.14	-1.00	1.00	0.25	Pass
630.96	-2.06	-0.16	-1.00	1.00	0.25	Pass
794.33	-0.95	-0.15	-1.00	1.00	0.25	Pass
1,000.00	0.00	0.00	-0.70	0.70	0.25	Pass
1,258.93	0.94	0.34	-1.00	1.00	0.25	Pass
1,584.89	1.01	0.01	-1.00	1.00	0.25	Pass
1,995.26	0.96	-0.24	-1.00	1.00	0.25	Pass
2,511.89	1.22	-0.08	-1.00	1.00	0.25	Pass
3,162.28	1.18	-0.02	-1.00	1.00	0.25	Pass
3,981.07	0.80	-0.21	-1.00	1.00	0.25	Pass
5,011.87	0.50	0.00	-1.50	1.50	0.25	Pass
6,309.57	-0.49	-0.39	-2.00	1.50	0.25	Pass
7,943.28	-1.21	-0.11	-2.50	1.50	0.25	Pass
10,000.00	-2.42	0.08	-3.00	2.00	0.25	Pass
12,589.25	-4.37	-0.07	-5.00	2.00	0.25	Pass
15,848.93	-6.86	-0.26	-16.00	2.50	0.25	Pass
19,952.62	-10.15	-0.85	-inf	3.00	0.25	Pass

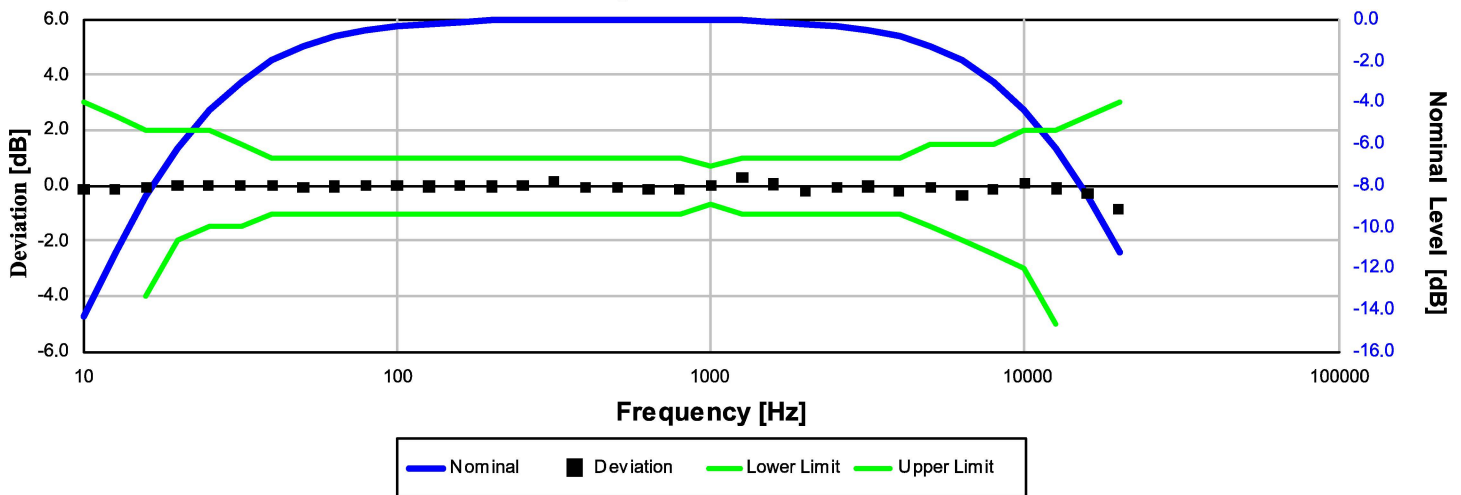
-- End of measurement results--

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C-weight Filter Response



Electrical signal test of frequency weighting performed according to IEC 61672-3:2013 13 and ANSI S1.4-2014 Part 3: 13 for compliance to IEC 61672-1:2013 5.5; IEC 60651:2001 6.1 and 9.2.2; IEC 60804:2000 5; ANSI S1.4:1983 (R2006) 5.1 and 8.2.1; ANSI S1.4-2014 Part 1: 5.5

Frequency [Hz]	Test Result [dB]	Deviation [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
10.00	-14.44	-0.14	-inf	3.00	0.25	Pass
12.59	-11.31	-0.11	-inf	2.50	0.25	Pass
15.85	-8.56	-0.06	-4.00	2.00	0.25	Pass
19.95	-6.20	0.00	-2.00	2.00	0.25	Pass
25.12	-4.39	0.01	-1.50	2.00	0.25	Pass
31.62	-2.97	0.03	-1.50	1.50	0.25	Pass
39.81	-1.99	0.01	-1.00	1.00	0.25	Pass
50.12	-1.34	-0.04	-1.00	1.00	0.25	Pass
63.10	-0.82	-0.02	-1.00	1.00	0.25	Pass
79.43	-0.47	0.03	-1.00	1.00	0.25	Pass
100.00	-0.28	0.02	-1.00	1.00	0.25	Pass
125.89	-0.23	-0.03	-1.00	1.00	0.25	Pass
158.49	-0.06	0.04	-1.00	1.00	0.25	Pass
199.53	-0.02	-0.02	-1.00	1.00	0.25	Pass
251.19	0.01	0.01	-1.00	1.00	0.25	Pass
316.23	0.15	0.15	-1.00	1.00	0.25	Pass
398.11	-0.08	-0.08	-1.00	1.00	0.25	Pass
501.19	-0.08	-0.08	-1.00	1.00	0.25	Pass
630.96	-0.13	-0.13	-1.00	1.00	0.25	Pass
794.33	-0.11	-0.11	-1.00	1.00	0.25	Pass
1,000.00	0.00	0.00	-0.70	0.70	0.25	Pass
1,258.93	0.32	0.32	-1.00	1.00	0.25	Pass
1,584.89	-0.05	0.05	-1.00	1.00	0.25	Pass
1,995.26	-0.41	-0.21	-1.00	1.00	0.25	Pass
2,511.89	-0.35	-0.05	-1.00	1.00	0.25	Pass
3,162.28	-0.52	-0.02	-1.00	1.00	0.25	Pass
3,981.07	-0.99	-0.19	-1.00	1.00	0.25	Pass
5,011.87	-1.34	-0.04	-1.50	1.50	0.25	Pass
6,309.57	-2.37	-0.37	-2.00	1.50	0.25	Pass
7,943.28	-3.11	-0.11	-2.50	1.50	0.25	Pass
10,000.00	-4.33	0.07	-3.00	2.00	0.25	Pass
12,589.25	-6.29	-0.09	-5.00	2.00	0.25	Pass
15,848.93	-8.79	-0.29	-16.00	2.50	0.25	Pass
19,952.62	-12.08	-0.88	-inf	3.00	0.25	Pass

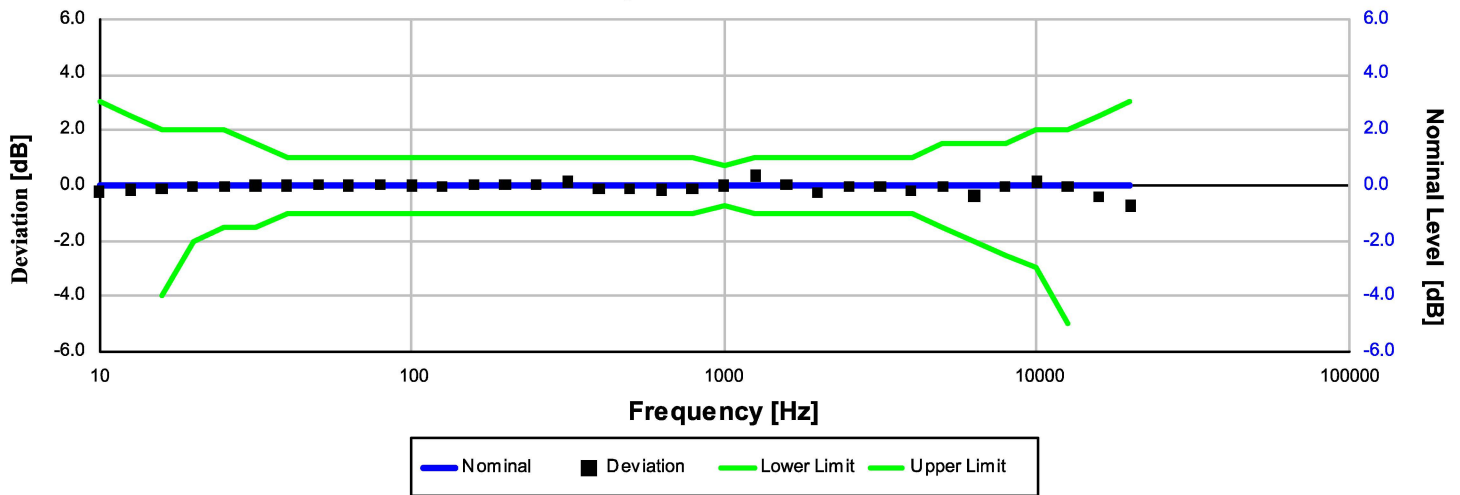
-- End of measurement results--

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Z-weight Filter Response



Electrical signal test of frequency weighting performed according to IEC 61672-3:2013 13 and ANSI S1.4-2014 Part 3: 13 for compliance to IEC 61672-1:2013 5.5; IEC 60651:2001 6.1 and 9.2.2; IEC 60804:2000 5; ANSI S1.4:1983 (R2006) 5.1 and 8.2.1; ANSI S1.4-2014 Part 1: 5.5

Frequency [Hz]	Test Result [dB]	Deviation [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
10.00	-0.23	-0.23	-inf	3.00	0.25	Pass
12.59	-0.15	-0.15	-inf	2.50	0.25	Pass
15.85	-0.10	-0.10	-4.00	2.00	0.25	Pass
19.95	-0.03	-0.03	-2.00	2.00	0.25	Pass
25.12	-0.04	-0.04	-1.50	2.00	0.25	Pass
31.62	-0.01	0.00	-1.50	1.50	0.25	Pass
39.81	-0.01	-0.01	-1.00	1.00	0.25	Pass
50.12	0.05	0.05	-1.00	1.00	0.25	Pass
63.10	-0.01	-0.01	-1.00	1.00	0.25	Pass
79.43	0.03	0.03	-1.00	1.00	0.25	Pass
100.00	0.00	0.00	-1.00	1.00	0.25	Pass
125.89	-0.06	-0.06	-1.00	1.00	0.25	Pass
158.49	0.03	0.03	-1.00	1.00	0.25	Pass
199.53	0.01	0.01	-1.00	1.00	0.25	Pass
251.19	0.03	0.03	-1.00	1.00	0.25	Pass
316.23	0.13	0.13	-1.00	1.00	0.25	Pass
398.11	-0.10	-0.10	-1.00	1.00	0.25	Pass
501.19	-0.11	-0.11	-1.00	1.00	0.25	Pass
630.96	-0.16	-0.15	-1.00	1.00	0.25	Pass
794.33	-0.12	-0.12	-1.00	1.00	0.25	Pass
1,000.00	0.00	0.00	-0.70	0.70	0.25	Pass
1,258.93	0.36	0.36	-1.00	1.00	0.25	Pass
1,584.89	0.03	0.03	-1.00	1.00	0.25	Pass
1,995.26	-0.24	-0.24	-1.00	1.00	0.25	Pass
2,511.89	-0.05	-0.05	-1.00	1.00	0.25	Pass
3,162.28	-0.03	-0.03	-1.00	1.00	0.25	Pass
3,981.07	-0.19	-0.19	-1.00	1.00	0.25	Pass
5,011.87	-0.05	-0.05	-1.50	1.50	0.25	Pass
6,309.57	-0.37	-0.37	-2.00	1.50	0.25	Pass
7,943.28	-0.06	-0.06	-2.50	1.50	0.25	Pass
10,000.00	0.14	0.14	-3.00	2.00	0.25	Pass
12,589.25	-0.04	-0.04	-5.00	2.00	0.25	Pass
15,848.93	-0.39	-0.39	-16.00	2.50	0.25	Pass
19,952.62	-0.74	-0.73	-inf	3.00	0.25	Pass

-- End of measurement results--

High Level Stability

Electrical signal test of high level stability performed according to IEC 61672-3:2013 21 and ANSI S1.4-2014 Part 3: 21 for compliance to IEC 61672-1:2013 5.15 and ANSI S1.4-2014 Part 1: 5.15

Measurement	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
High Level Stability	0.01	-0.10	0.10	0.00 ±	Pass
-- End of measurement results--					

Long-Term Stability

Electrical signal test of long term stability performed according to IEC 61672-3:2013 15 and ANSI S1.4-2014 Part 3: 15 for compliance to IEC 61672-1:2013 5.14 and ANSI S1.4-2014 Part 1: 5.14

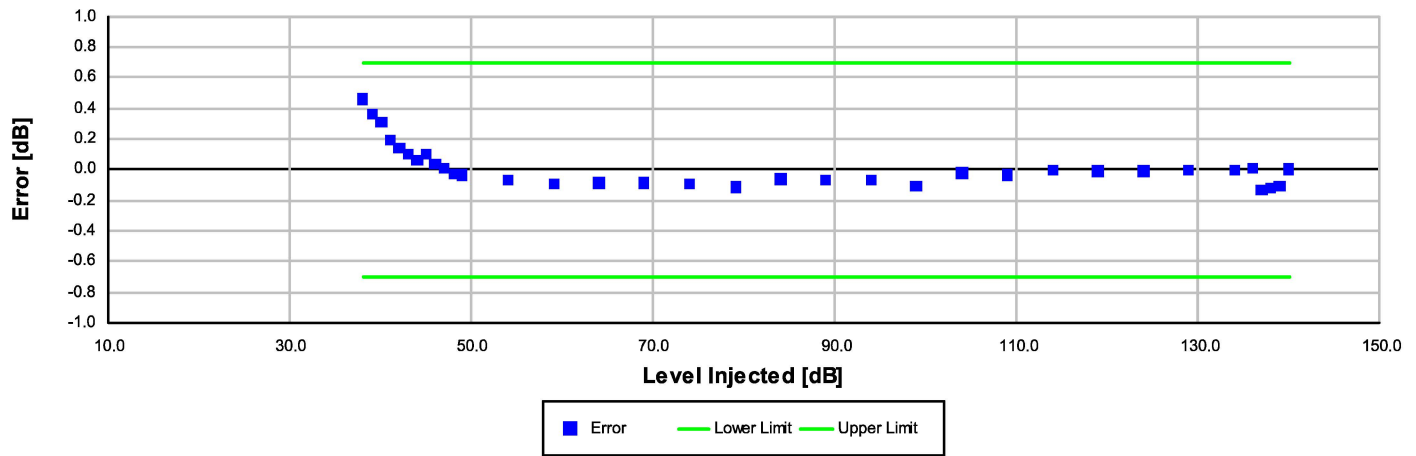
Test Duration [min]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
32	0.00	-0.10	0.10	0.01 ±	Pass
-- End of measurement results--					

1 kHz Reference Levels

Frequency weightings and time weightings at 1 kHz (reference is A weighted Fast) performed according to IEC 61672-3:2013 14 and ANSI S1.4-2014 Part 3: 14 for compliance to IEC 61672-1:2013 5.5.9 and 5.8.3 and ANSI S1.4-2014 Part 1: 5.5.9 and 5.8.3

Measurement	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
C weight	115.19	114.99	115.39	0.15	Pass
Z weight	115.18	114.99	115.39	0.15	Pass
Slow	115.19	115.09	115.29	0.15	Pass
Impulse	115.19	115.09	115.29	0.15	Pass
-- End of measurement results--					

A-weighted Broadband Log Linearity: 8,000.00 Hz



Broadband level linearity performed according to IEC 61672-3:2013 16 and ANSI S1.4-2014 Part 3: 16 for compliance to IEC 61672-1:2013 5.6, IEC 60804:2000 6.2, IEC 61252:2002 8, ANSI S1.4 (R2006) 6.9, ANSI S1.4-2014 Part 1: 5.6, ANSI S1.43 (R2007) 6.2

Level [dB]	Error [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
38.00	0.46	-0.70	0.70	0.16	Pass
39.00	0.37	-0.70	0.70	0.16	Pass
40.00	0.31	-0.70	0.70	0.16	Pass
41.00	0.19	-0.70	0.70	0.16	Pass
42.00	0.14	-0.70	0.70	0.16	Pass
43.00	0.10	-0.70	0.70	0.16	Pass
44.00	0.06	-0.70	0.70	0.17	Pass
45.00	0.10	-0.70	0.70	0.16	Pass
46.00	0.04	-0.70	0.70	0.16	Pass
47.00	0.01	-0.70	0.70	0.16	Pass
48.00	-0.03	-0.70	0.70	0.16	Pass
49.00	-0.03	-0.70	0.70	0.16	Pass
54.00	-0.07	-0.70	0.70	0.16	Pass
59.00	-0.09	-0.70	0.70	0.16	Pass
64.00	-0.09	-0.70	0.70	0.16	Pass
69.00	-0.09	-0.70	0.70	0.16	Pass
74.00	-0.09	-0.70	0.70	0.16	Pass
79.00	-0.11	-0.70	0.70	0.16	Pass
84.00	-0.06	-0.70	0.70	0.16	Pass
89.00	-0.06	-0.70	0.70	0.16	Pass
94.00	-0.06	-0.70	0.70	0.16	Pass
99.00	-0.11	-0.70	0.70	0.15	Pass
104.00	-0.02	-0.70	0.70	0.15	Pass
109.00	-0.03	-0.70	0.70	0.15	Pass
114.00	0.00	-0.70	0.70	0.15	Pass
119.00	-0.01	-0.70	0.70	0.15	Pass
124.00	-0.01	-0.70	0.70	0.15	Pass
129.00	0.00	-0.70	0.70	0.15	Pass
134.00	0.00	-0.70	0.70	0.15	Pass
136.00	0.01	-0.70	0.70	0.15	Pass
137.00	-0.13	-0.70	0.70	0.15	Pass
138.00	-0.12	-0.70	0.70	0.15	Pass
139.00	-0.10	-0.70	0.70	0.15	Pass
140.00	0.00	-0.70	0.70	0.15	Pass

-- End of measurement results--

Slow Detector

Toneburst response performed according to IEC 61672-3:2013 18 and ANSI S1.4-2014 Part 3: 18 for compliance to IEC 61672-1:2013 5.9, IEC 60651:2001 9.4.2, ANSI S1.4:1983 (R2006) 8.4.2 and ANSI S1.4-2014 Part 1: 5.9

Amplitude [dB]	Duration [ms]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
137.00	200	-7.53	-7.92	-6.92	0.15	Pass
	2	-27.14	-29.99	-25.99	0.15	Pass
-- End of measurement results--						

Fast Detector

Toneburst response performed according to IEC 61672-3:2013 18 and ANSI S1.4-2014 Part 3: 18 for compliance to IEC 61672-1:2013 5.9, IEC 60651:2001 9.4.2, ANSI S1.4:1983 (R2006) 8.4.2 and ANSI S1.4-2014 Part 1: 5.9

Amplitude [dB]	Duration [ms]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
137.00	200.00	-1.05	-1.48	-0.48	0.26	Pass
	2.00	-18.25	-19.49	-16.99	0.15	Pass
	0.25	-27.30	-29.99	-25.99	0.15	Pass
-- End of measurement results--						

Sound Exposure Level

Toneburst response performed according to IEC 61672-3:2013 18 and ANSI S1.4-2014 Part 3: 18 for compliance to IEC 61672-1:2013 5.9, IEC 60651:2001 9.4.2, ANSI S1.4:1983 (R2006) 8.4.2 and ANSI S1.4-2014 Part 1: 5.9

Amplitude [dB]	Duration [ms]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
137.00	200.00	-7.01	-7.49	-6.49	0.15	Pass
	2.00	-27.03	-28.49	-25.99	0.15	Pass
	0.25	-36.14	-39.02	-35.02	0.15	Pass
-- End of measurement results--						

Peak C-weight

C-weighted peak sound level performed according to IEC 61672-3:2013 19 and ANSI S1.4-2014 Part 3: 19 for compliance to IEC 61672-1:2013 5.13 and ANSI S1.4-2014 Part 1: 5.13

Level [dB]	Frequency [Hz]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
135.00	31.50	138.21	135.50	139.50	0.15	Pass
135.00	500.00	138.56	137.50	139.50	0.15	Pass
135.00	8,000.00	137.76	136.40	140.40	0.15	Pass
135.00, Negative	500.00	137.18	136.40	138.40	0.15	Pass
135.00, Positive	500.00	137.16	136.40	138.40	0.15	Pass
-- End of measurement results--						

Peak Z-weight

Z-weighted peak sound level performed according to IEC 60651:2001 9.4.4 and ANSI S1.4:1983 (R2006) 8.4.4

Amplitude [dB]	Duration[μs]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result	
134.85	100	Negative Pulse	135.65	133.31	137.31	0.15	Pass
	100	Positive Pulse	135.63	133.29	137.29	0.15	Pass
124.85	100	Negative Pulse	126.33	123.99	127.99	0.15	Pass
	100	Positive Pulse	126.32	123.98	127.98	0.15	Pass
114.85	100	Negative Pulse	116.34	114.00	118.00	0.15	Pass
	100	Positive Pulse	116.33	113.99	117.99	0.15	Pass
104.85	100	Negative Pulse	106.29	103.96	107.96	0.15	Pass
	100	Positive Pulse	106.29	103.95	107.95	0.15	Pass

-- End of measurement results--

Overload Detector

Overload indication performed according to IEC 61672-3:2013 20 and ANSI S1.4-2014 Part 3: 20 for compliance to IEC 61672-1:2013 5.11, IEC 60804:2000 9.3.5, IEC 61252:2002 11, ANSI S1.4 (R2006) 5.8, and ANSI S1.4-2014 Part 1: 5.11, ANSI S1.25 (R2007) 7.6, ANSI S1.43 (R2007) 7

Measurement	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
Positive	141.30	140.00	143.00	0.15	Pass
Negative	141.40	140.00	143.00	0.15	Pass
Difference	-0.10	-1.50	1.50	0.15	Pass

-- End of measurement results--

Peak Rise Time

Peak rise time performed according to IEC 60651:2001 9.4.4 and ANSI S1.4:1983 (R2006) 8.4.4

Amplitude [dB]	Duration [μs]		Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
137.85	40	Negative Pulse	134.75	133.31	135.31	0.15	Pass
		Positive Pulse	134.73	133.29	135.29	0.15	Pass
	30	Negative Pulse	133.79	133.31	135.31	0.15	Pass
		Positive Pulse	133.78	133.29	135.29	0.15	Pass

-- End of measurement results--

Positive Pulse Crest Factor

200 μ s pulse tests at 2.0, 12.0, 22.0, 32.0 dB below Overload Limit

Crest Factor measured according to IEC 60651:2001 9.4.2 and ANSI S1.4:1983 (R2006) 8.4.2

Amplitude [dB]	Crest Factor	Test Result [dB]	Limits [dB]	Expanded Uncertainty [dB]	Result
136.85	3	OVLD	± 0.50	0.15 $\pm$	Pass
	5	OVLD	± 1.00	0.15 $\pm$	Pass
	10	OVLD	± 1.50	0.15 $\pm$	Pass
126.85	3	-0.15	± 0.50	0.15 $\pm$	Pass
	5	-0.13	± 1.00	0.16 $\pm$	Pass
	10	OVLD	± 1.50	0.15 $\pm$	Pass
116.85	3	-0.17	± 0.50	0.15 $\pm$	Pass
	5	-0.15	± 1.00	0.15 $\pm$	Pass
	10	-0.19	± 1.50	0.15 $\pm$	Pass
106.85	3	-0.16	± 0.50	0.15 $\pm$	Pass
	5	-0.13	± 1.00	0.15 $\pm$	Pass
	10	-0.11	± 1.50	0.15 $\pm$	Pass
-- End of measurement results--					

Negative Pulse Crest Factor

200 μ s pulse tests at 2.0, 12.0, 22.0, 32.0 dB below Overload Limit

Crest Factor measured according to IEC 60651:2001 9.4.2 and ANSI S1.4:1983 (R2006) 8.4.2

Amplitude [dB]	Crest Factor	Test Result [dB]	Limits [dB]	Expanded Uncertainty [dB]	Result
136.85	3	OVLD	± 0.50	0.15 $\pm$	Pass
	5	OVLD	± 1.00	0.15 $\pm$	Pass
	10	OVLD	± 1.50	0.15 $\pm$	Pass
126.85	3	-0.14	± 0.50	0.15 $\pm$	Pass
	5	-0.14	± 1.00	0.15 $\pm$	Pass
	10	OVLD	± 1.50	0.15 $\pm$	Pass
116.85	3	-0.15	± 0.50	0.15 $\pm$	Pass
	5	-0.14	± 1.00	0.15 $\pm$	Pass
	10	-0.18	± 1.50	0.15 $\pm$	Pass
106.85	3	-0.15	± 0.50	0.15 $\pm$	Pass
	5	-0.11	± 1.00	0.15 $\pm$	Pass
	10	-0.08	± 1.50	0.15 $\pm$	Pass
-- End of measurement results--					

Tone Burst

2kHz tone burst tests at 2.0, 12.0, 22.0, 32.0 dB below Overload Limit

Tone burst response measured according to IEC 60651:2001 9.4.2 and ANSI S1.4:1983 (R2006) 8.4.2

Amplitude [dB]	Crest Factor	Test Result [dB]	Limits [dB]	Expanded Uncertainty [dB]	Result
136.85	3	OVLD	± 0.50	0.15	Pass
	5	OVLD	± 1.00	0.15	Pass
126.85	3	-0.10	± 0.50	0.15	Pass
	5	-0.03	± 1.00	0.15	Pass
116.85	3	-0.11	± 0.50	0.15	Pass
	5	-0.10	± 1.00	0.15	Pass
106.85	3	-0.12	± 0.50	0.15	Pass
	5	-0.10	± 1.00	0.15	Pass
-- End of measurement results--					

Impulse Detector - Repeat

Impulse Detector measured according to IEC 60651:2001 9.4.3 and ANSI S1.4:1983 (R2006) 8.4.3

Amplitude [dB]	Repetition Rate [Hz]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
140	100.00	-2.82	-3.71	-1.71	0.15	Pass
	20.00	-7.23	-9.57	-5.57	0.20	Pass
	2.00	-8.73	-10.76	-6.76	0.15	Pass
Step	2.00	5.14	4.00	6.00	0.15	Pass
-- End of measurement results--						

Impulse Detector - Single

Impulse Detector measured according to IEC 60651:2001 9.4.3 and ANSI S1.4:1983 (R2006) 8.4.3

Amplitude [dB]	Duration [ms]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
140	20.00	-3.76	-5.11	-2.11	0.15	Pass
	5.00	-8.97	-10.76	-6.76	0.16	Pass
	2.00	-12.64	-14.55	-10.55	0.16	Pass
Step	2.00	10.03	9.00	11.00	0.16	Pass
-- End of measurement results--						

Gain

Gain measured according to IEC 61672-3:2013 17.3 and 17.4 and ANSI S1.4-2014 Part 3: 17.3 and 17.4

Measurement	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
0 dB Gain	93.96	93.91	94.11	0.15	Pass
0 dB Gain, Linearity	41.16	40.31	41.71	0.16	Pass
OBA Low Range	94.01	93.91	94.11	0.15	Pass
OBA Normal Range	94.01	93.20	94.80	0.15	Pass
-- End of measurement results--					

Broadband Noise Floor

Self-generated noise measured according to IEC 61672-3:2013 11.2 and ANSI S1.4-2014 Part 3: 11.2

Measurement	Test Result [dB]	Upper limit [dB]	Result
A-weight Noise Floor	27.00	36.00	Pass
C-weight Noise Floor	26.99	35.00	Pass
Z-weight Noise Floor	32.96	39.00	Pass

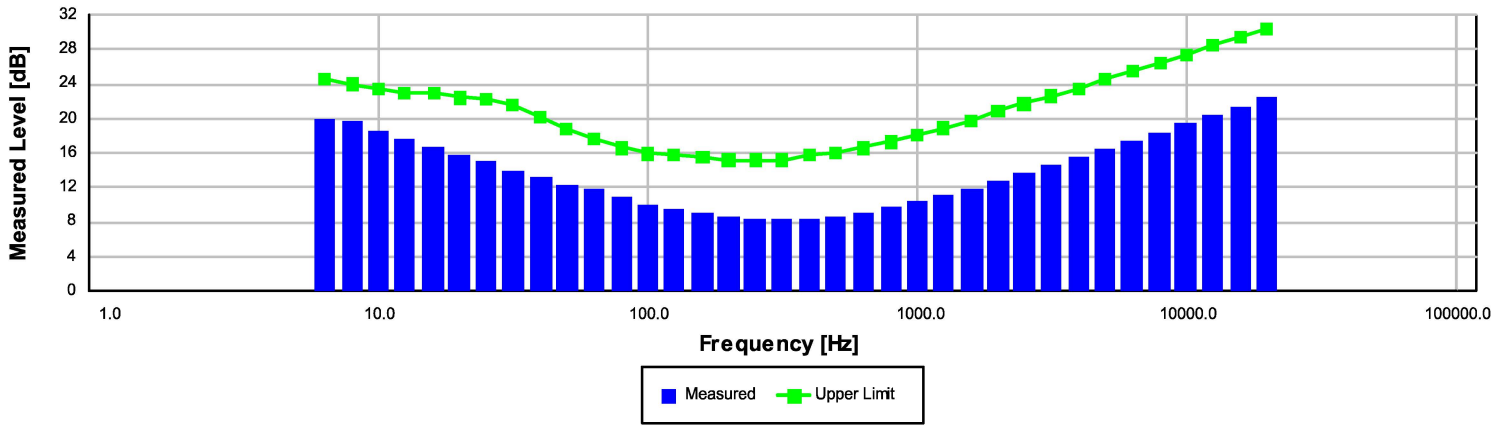
-- End of measurement results--

Total Harmonic Distortion

Measured using 1/3-Octave filters

Measurement	Test Result [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
10 Hz Signal	135.35	135.05	136.65	0.15	Pass
THD	-67.15		-58.00	0.00 ±	Pass
THD+N	-63.00		-58.00	0.00 ±	Pass
-- End of measurement results--					

1/3-Octave Self-Generated Noise



The SLM is set to low range.

Frequency [Hz]	Test Result [dB]	Upper limit [dB]	Result
6.30	19.99	24.60	Pass
8.00	19.61	24.00	Pass
10.00	18.46	23.50	Pass
12.50	17.65	23.00	Pass
16.00	16.78	22.90	Pass
20.00	15.68	22.40	Pass
25.00	15.19	22.30	Pass
31.50	14.00	21.50	Pass
40.00	13.33	20.20	Pass
50.00	12.33	18.80	Pass
63.00	11.78	17.60	Pass
80.00	10.81	16.60	Pass
100.00	10.01	15.90	Pass
125.00	9.51	15.70	Pass
160.00	9.00	15.50	Pass
200.00	8.71	15.20	Pass
250.00	8.41	15.20	Pass
315.00	8.46	15.20	Pass
400.00	8.40	15.70	Pass
500.00	8.71	16.00	Pass
630.00	9.14	16.60	Pass
800.00	9.71	17.30	Pass
1,000.00	10.38	18.10	Pass
1,250.00	11.07	18.90	Pass
1,600.00	11.91	19.80	Pass
2,000.00	12.76	20.80	Pass
2,500.00	13.66	21.70	Pass
3,150.00	14.54	22.60	Pass
4,000.00	15.51	23.50	Pass
5,000.00	16.46	24.50	Pass
6,300.00	17.44	25.50	Pass
8,000.00	18.42	26.50	Pass
10,000.00	19.42	27.40	Pass
12,500.00	20.42	28.50	Pass
16,000.00	21.39	29.50	Pass
20,000.00	22.40	30.40	Pass

-- End of measurement results--

-- End of Report--

Signatory: Jacob Cannon

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1681 West 820 North
Provo, UT 84601, United States
716-684-0001



Calibration Certificate

Certificate Number 2022015829

Customer:

Sistemas De Instrumentacion
Concha Y Toro # 65
Santiago Centro
Santiago, Chile

Model Number CAL200
Serial Number 20915
Test Results Pass
Initial Condition As Manufactured
Description Larson Davis CAL200 Acoustic Calibrator

Procedure Number D0001.8386
Technician Scott Montgomery
Calibration Date 14 Dec 2022
Calibration Due 14 Dec 2024
Temperature 23 °C ± 0.3 °C
Humidity 34 %RH ± 3 %RH
Static Pressure 101.1 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	07/07/2022	07/07/2023	001021
Larson Davis Model 2900 Real Time Analyzer	03/31/2022	03/31/2023	001051
Microphone Calibration System	02/23/2022	02/23/2023	005446
1/2" Preamplifier	08/23/2022	08/23/2023	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/08/2022	08/08/2023	006507
1/2 inch Microphone - RI - 200V	03/24/2022	03/24/2023	006511
Hart Scientific 2626-S Humidity/Temperature Sensor	07/29/2021	01/29/2023	006946
Pressure Sensor	03/15/2022	12/14/2022	PCB0087008

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716-684-0001



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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	101.1	114.00	113.80	114.20	0.14	Pass
94	101.1	94.02	93.80	94.20	0.14	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	101.1	1,000.02	993.00	1,007.00	0.20	Pass
94	101.1	1,000.01	993.00	1,007.00	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	101.1	0.31	0.00	2.00	0.25 ±	Pass
94	101.1	0.35	0.00	2.00	0.25 ±	Pass

-- End of measurement results--

Level Change Over Pressure

Tested at: 114 dB, 24 °C, 27 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
108.0	107.6	-0.04	-0.25	0.25	0.04 ±	Pass
101.3	100.9	0.00	-0.25	0.25	0.04 ±	Pass
92.0	92.0	0.03	-0.25	0.25	0.04 ±	Pass
83.0	83.0	0.04	-0.25	0.25	0.04 ±	Pass
74.0	74.0	-0.01	-0.25	0.25	0.04 ±	Pass
65.0	65.0	-0.15	-0.25	0.25	0.04 ±	Pass

-- End of measurement results--

Frequency Change Over Pressure

Tested at: 114 dB, 24 °C, 27 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [Hz]	Lower limit [Hz]	Upper limit [Hz]	Expanded Uncertainty [Hz]	Result
108.0	107.6	0.00	-7.00	7.00	0.20 ±	Pass
101.3	100.9	0.00	-7.00	7.00	0.20 ±	Pass
92.0	92.0	0.00	-7.00	7.00	0.20 ±	Pass
83.0	83.0	0.00	-7.00	7.00	0.20 ±	Pass
74.0	74.0	-0.01	-7.00	7.00	0.20 ±	Pass
65.0	65.0	-0.02	-7.00	7.00	0.20 ±	Pass

-- End of measurement results--

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716-684-0001



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

Tested at: 114 dB, 24 °C, 27 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [%]	Lower limit [%]	Upper limit [%]	Expanded Uncertainty [%]	Result
108.0	107.6	0.31	0.00	2.00	0.25 ±	Pass
101.3	100.9	0.30	0.00	2.00	0.25 ±	Pass
92.0	92.0	0.29	0.00	2.00	0.25 ±	Pass
83.0	83.0	0.29	0.00	2.00	0.25 ±	Pass
74.0	74.0	0.29	0.00	2.00	0.25 ±	Pass
65.0	65.0	0.29	0.00	2.00	0.25 ±	Pass

-- End of measurement results--

Signatory: Scott Montgomery

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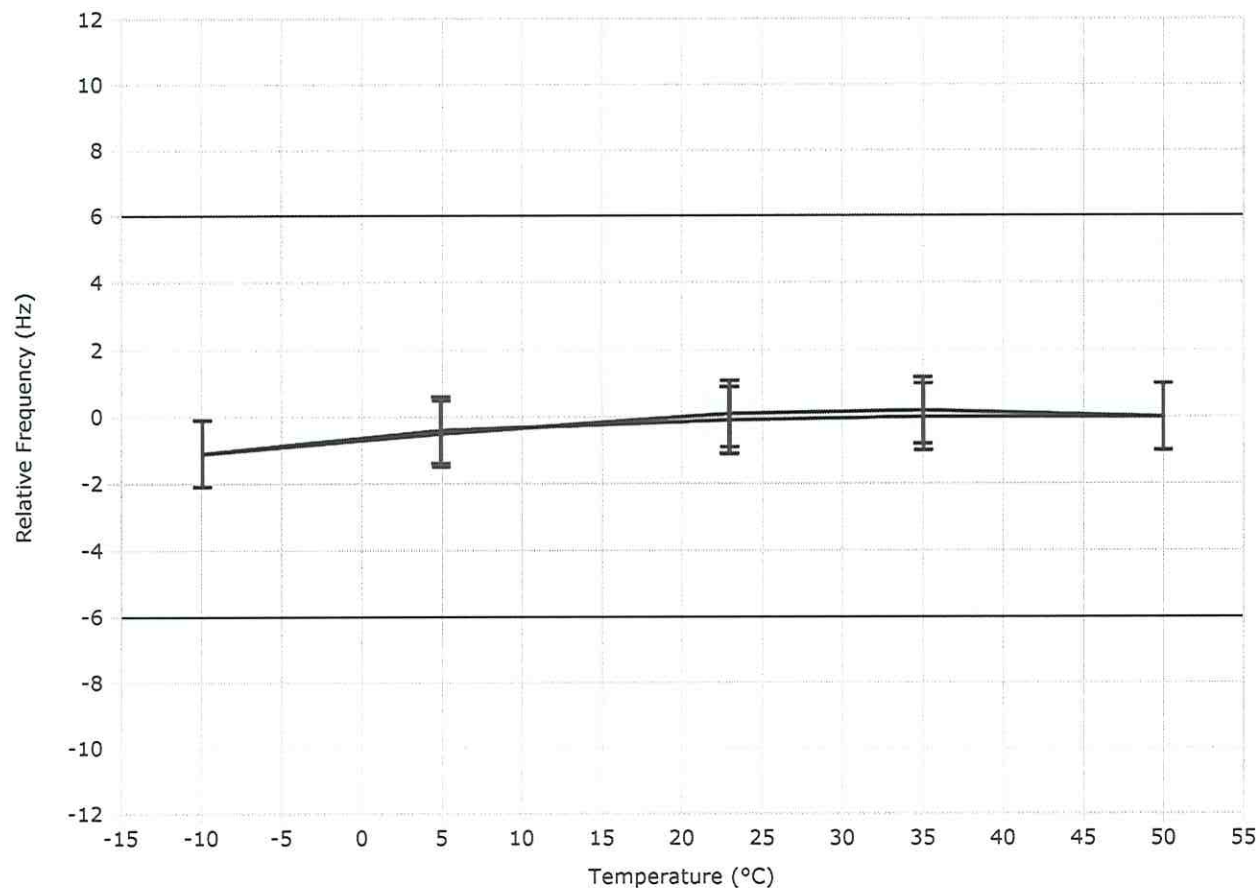
Model CAL200 Relative Frequency vs. Temperature

Larson Davis Model CAL200 Serial Number: 20915

Model CAL200 Relative Frequency vs. Temperature at 50% RH.

A 2559 Mic (SN: 2994) with a PRM901 Preamp (SN: 0120), station 18 was used to check the levels.

Test Date: 03 Nov 2022 1:56:01 PM



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

Sequence File: CAL200.SEQ

Test Location: Larson Davis – A PCB Division
1681 West 820 North, Provo, Utah 84601
Tel: 716 684-0001 www.LarsonDavis.com

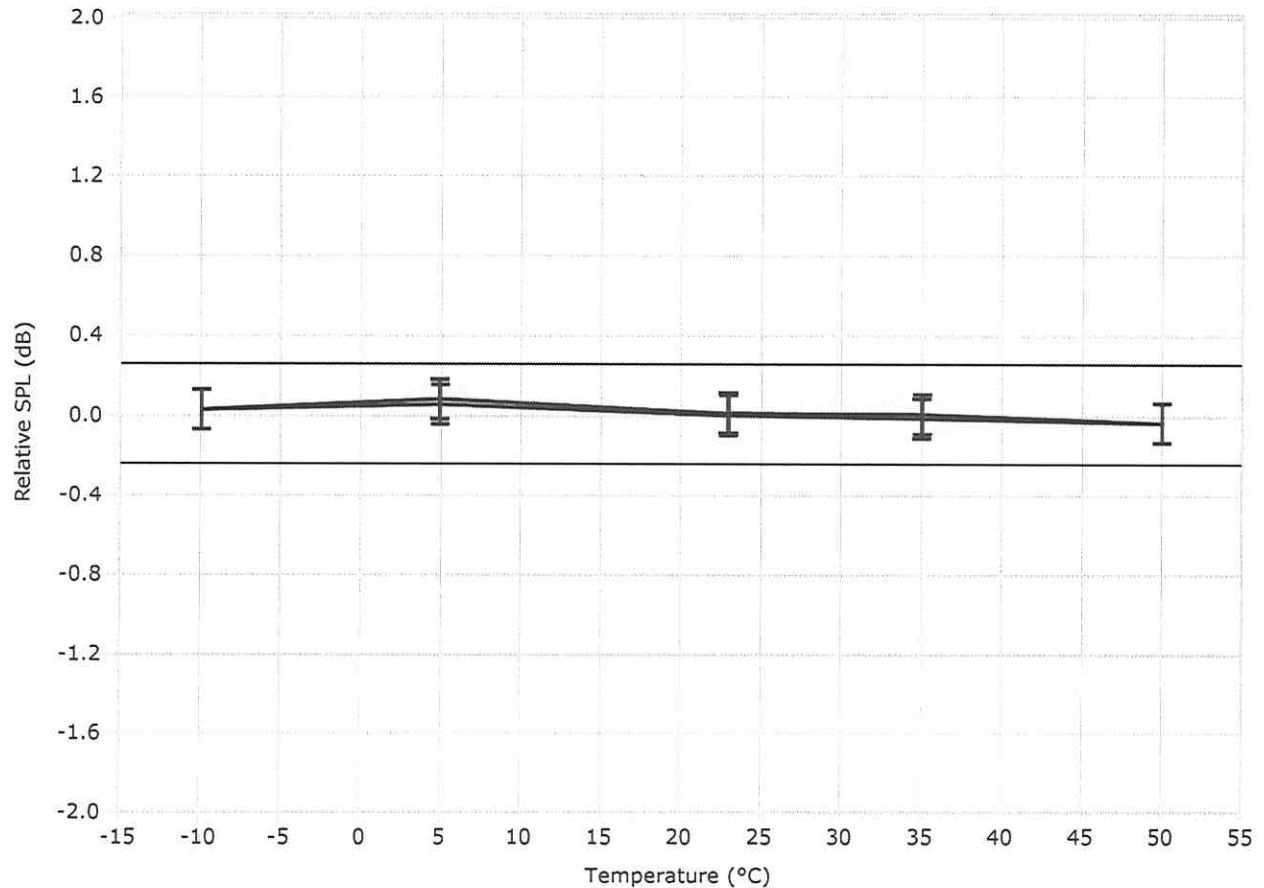


Model CAL200 Relative SPL vs. Temperature

Larson Davis Model CAL200 Serial Number: 20915

Model CAL200 Relative SPL vs. Temperature at 50% RH.
A 2559 Mic (SN: 2994) with a PRM901 Preamp (SN: 0120), station 18 was used to check the levels.

Test Date: 03 Nov 2022 1:56:01 PM



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

Sequence File: CAL200.SEQ

Test Location: Larson Davis – A PCB Division
1681 West 820 North, Provo, Utah 84601
Tel: 716 684-0001 www.LarsonDavis.com

Calibration Certificate

Certificate Number 2023000083

Customer:

Sistemas De Instrumentacion

Concha Y Toro # 65

Santiago Centro

Santiago, , Chile

Model Number LxT1
Serial Number 0007263
Test Results **Pass**

Initial Condition As Manufactured

Description SoundTrack LxT Class 1
Class 1 Sound Level Meter
Firmware Revision: 2.404

Procedure Number D0001.8384
Technician Jacob Cannon
Calibration Date 4 Jan 2023
Calibration Due 4 Jan 2025
Temperature 23.62 °C ± 0.25 °C
Humidity 49.2 %RH ± 2.0 %RH
Static Pressure 86.67 kPa ± 0.13 kPa

Evaluation Method **Tested with:** **Data reported in dB re 20 µPa.**

Larson Davis CAL291. S/N 0108
Larson Davis CAL200. S/N 9079
Larson Davis PRMLxT1. S/N 077607
PCB 377B02. S/N 337299

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8378:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61252:2002	ANSI S1.11 (R2009) Class 1
IEC 61260:2001 Class 1	ANSI S1.25 (R2007)
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1

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 International System of Units (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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Correction data from Larson Davis LxT Manual for SoundTrack LxT & SoundExpert Lxt, I770.01 Rev O Supporting Firmware Version 4.0.5, 2019-09-10

For 1/4" microphones, the Larson Davis ADP024 1/4" to 1/2" adaptor is used with the calibrators and the Larson Davis ADP043 1/4" to

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1/2" adaptor is used with the preamplifier.

Calibration Check Frequency: 1000 Hz; Reference Sound Pressure Level: 114 dB re 20 µPa

Periodic tests were performed in accordance with procedures from IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part3.

Pattern approval for IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 successfully completed by Physikalisch-Technische Bundesanstalt (PTB) on 2007-10-09 reference number PTB-1.72-4034218.

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part 3, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organization responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013 / ANSI/ASA S1.4-2014/Part 2, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1; the sound level meter submitted for testing conforms to the class 1 specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Larson Davis CAL291 Residual Intensity Calibrator	2022-09-09	2023-09-09	001250
Hart Scientific 2626-H Temperature Probe	2021-08-25	2023-02-25	006798
Larson Davis CAL200 Acoustic Calibrator	2022-07-21	2023-07-21	007027
Larson Davis Model 831	2022-02-21	2023-02-21	007182
PCB 377A13 1/2 inch Prepolarized Pressure Microphone	2022-03-02	2023-03-02	007185
SRS DS360 Ultra Low Distortion Generator	2022-03-29	2023-03-29	007635
Larson Davis 1/2" Preamplifier for Model 831 Type 1	2022-09-28	2023-09-28	PCB0004783

Acoustic Calibration

Measured according to IEC 61672-3:2013 10 and ANSI S1.4-2014 Part 3: 10

Measurement	Test Result [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
1000 Hz	114.01	113.80	114.20	0.14	Pass

Loaded Circuit Sensitivity

Measurement	Test Result [dB re 1 V / Pa]	Lower Limit [dB re 1 V / Pa]	Upper Limit [dB re 1 V / Pa]	Expanded Uncertainty [dB]	Result
1000 Hz	-50.19	-52.44	-48.33	0.14	Pass

-- End of measurement results--

Acoustic Signal Tests, C-weighting

Measured according to IEC 61672-3:2013 12 and ANSI S1.4-2014 Part 3: 12 using a comparison coupler with Unit Under Test (UUT) and reference SLM using slow time-weighted sound level for compliance to IEC 61672-1:2013 5.5; ANSI S1.4-2014 Part 1: 5.5

Frequency [Hz]	Test Result [dB]	Expected [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
125	-0.22	-0.20	-1.20	0.80	0.23	Pass
1000	0.13	0.00	-0.70	0.70	0.23	Pass
8000	-2.67	-3.00	-5.50	-1.50	0.32	Pass

-- End of measurement results--

LARSON DAVIS – A PCB DIVISION
1681 West 820 North
Provo, UT 84601, United States
716-684-0001



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Self-generated Noise

Measured according to IEC 61672-3:2013 11.1 and ANSI S1.4-2014 Part 3: 11.1

Measurement	Test Result [dB]
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A-weighted	40.57
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-- End of measurement results--

-- End of Report--

Signatory: Jacob Cannon

LARSON DAVIS – A PCB DIVISION
1681 West 820 North
Provo, UT 84601, United States
716-684-0001



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