REPORTE TÉCNICO DECRETO SUPREMO N°38/11 DEL MINISTERIO DEL MEDIO AMBIENTE

Establece Norma de Emisión de Ruidos Generados por Fuentes que Indica

FICHA DE INFORMACIÓN DE MEDICIÓN DE RUIDO

IDENTIFICACIÓN DE LA FUENTE EMISORA DE RUIDO

Nombre o razón social	CONSTRUCTORA INGAL SPA		
RUT	96973480-K		
Dirección	**Fuente emisora: Vicuña Mackenna 0395**; Casa Matriz: Avenida Lib Gral B.O"Higgins 2205		
Comuna	La Granja		
Nombre de Zona de emplazamiento (según IPT vigente)	ZC-2 Villa padre Alberto Hurtado ll		
Datum	WGS 84	Huso	19H
Coordenada Norte	6286838.55 m S	Coordenada Este	348781.92 m E

CARACTERIZACIÓN DE LA FUENTE EMISORA DE RUIDO

Actividad Productiva	☐ Industrial	☐ Agrícola	☐ Extracción	☐ Otro
Actividad Comercial	☐ Restaurant	☐ Taller Mecánico	☐ Local Comercial	☐ Otro
Actividad Esparcimiento	☐ Discoteca	☐ Recinto Deportivo	☐ Cultura	☐ Otro
Actividad de Servicio	☐ Religioso	☐ Salud	☐ Comunitario	☐ Otro
Infraestructura Transporte	☐ Terminal	☐ Taller de Transporte	☐ Estación Intermedia	☐ Otro
Infraestructura Sanitaria	☐ Planta de Tratamiento	☐ Relleno Sanitario	☐ Instalación de Distribución	☐ Otro
Infraestructura Energética	☐ Generadora	☐ Distribución Eléctrica	☐ Comunicaciones	☐ Otro
Faena Constructiva	☑ Construcción	☐ Demolición	☐ Reparación	☐ Otro
Otro (Especificar)				

INSTRUMENTAL DE MEDICIÓN

Identificación sonómetro					
Marca	Larson Davis	Modelo	LxT2	N° serie	5313
Fecha de emisión Certificado de Calibración			13-11-2019		
Número de Certificado de Calibración			2019013841		
Identificación calibrador					
Marca	Larson Davis	Modelo	CAL 150	N° serie	6266
Fecha de emisión Certificado de Calibración			25-02-2019		
Número de Certificado de Calibración			2019013084		
Ponderación en frecuencia	A		Ponderación temporal		Lenta
Verificación de Calibración en Terreno	☑ Si		☐ No		
Se deberá adjuntar Certificado de Calibración Periódica Vigente para ambos instrumentos.					

REPORTE TÉCNICO DECRETO SUPREMO N°38/11 DEL MINISTERIO DEL MEDIO AMBIENTE

Establece Norma de Emisión de Ruidos Generados por Fuentes que Indica

FICHA DE GEORREFERENCIACIÓN DE MEDICIÓN DE RUIDO

☐ Croquis	☑ Imagen Satelital

Origen de la imagen Satelital	Google Earth Pro
Escala de la imagen Satelital	25m

LEYENDA DE CROQUIS O IMAGEN UTILIZADA

Datum		WGS 84		**Huso**		19H	
Fuentes				**Receptores**			
Símbolo	**Nombre**	**Coordenadas**		**Símbolo**	**Nombre**	**Coordenadas**	
	Vicuña Mackenna 0395	**N**	6286838.00 m S		Vicuña Mackenna 0341	**N**	6286867.00 m S
		E	348781.00 m E			**E**	348776.00 m E
		N				**N**	
		E				**E**	
		N				**N**	
		E				**E**	
		N				**N**	
		E				**E**	

Se podrán adjuntar fotografías, considerando como máximo una (1) por fuente y dos (2) por lugar de medición.

REPORTE TÉCNICO DECRETO SUPREMO N°38/11 DEL MINISTERIO DEL MEDIO AMBIENTE

Establece Norma de Emisión de Ruidos Generados por Fuentes que Indica

FICHA DE INFORMACIÓN DE MEDICIÓN DE RUIDO

IDENTIFICACIÓN DEL RECEPTOR

Receptor N°	1				
Calle	Vicuña Mackenna				
Número	341				
Comuna	La Granja				
Datum	WGS 84		Huso	19H	
Coordenada Norte	6286867.00 m S		Coordenada Este	348776.00 m E	
Nombre de Zona de emplazamiento (según IPT vigente)	ZC-2 Villa padre Alberto Hurtado ll				
N° de Certificado de Informaciones Previas*					
Zonificación DS N° 38/11 MMA	☐ I	☐ II	☑ III	☐ IV	☐ Rural

** Adjuntar Certificado de Informaciones Previas (Si corresponde, según consideraciones de Art. 8°, D.S. N° 38/11 MMA)*

CONDICIONES DE MEDICIÓN

Fecha medición	13-07-2021				
Hora inicio medición	10:32				
Hora término medición	10:41				
Periodo de medición	☑ 7:00 a 21:00 h		☐ 21:00 a 7:00 h		
Lugar de medición	☑ Medición Interna		☐ Medición Externa		
Descripción del lugar de medición	Habitación trasera 2 piso. Ubicada justo al lado de la faena de construcción.				
Condiciones de ventana (en caso de medición interna)	☑ Ventana Abierta		☐ Ventana Cerrada		
Identificación ruido de fondo	Tránsito vehicular bajo por calle Vicuña Mackenna				
Temperatura [°C]		Humedad [%]		Velocidad de viento [m/s]	

Nombre y firma profesional de terreno o Inspector Ambiental (IA)	Atilio Zamora	
Institución, Empresa o Entidad Técnica de Fiscalización Ambiental (ETFA)	Ilustre Municipalidad de La Granja	

Nota:

- *Se deberá imprimir y completar esta página para cada receptor evaluado.*
- *Se podrán incluir fotografías del punto donde se ubique el sonómetro para la realización de la medición.*
- *Los datos de Temperatura, Humedad Relativa y Velocidad de viento, corresponderá para mediciones realizadas en el exterior.*

REPORTE TÉCNICO DECRETO SUPREMO N°38/11 DEL MINISTERIO DEL MEDIO AMBIENTE

Establece Norma de Emisión de Ruidos Generados por Fuentes que Indica

FICHA DE MEDICIÓN DE NIVELES DE RUIDO

REGISTRO DE MEDICIÓN DE RUIDO DE FUENTE EMISORA

Identificación Receptor N°	1
☑ Medición Interna (tres puntos)	☐ Medición externa (un punto)

	NPSeq	NPSmin	NPSmáx
Punto 1	66,6	59,9	71,9
	66,1	59,7	71,5
	65,8	56,9	70,2

	NPSeq	NPSmin	NPSmáx
Punto 2	68,8	60	72,6
	68,4	59,9	71,2
	67,9	59,7	70,2

	NPSeq	NPSmin	NPSmáx
Punto 3	61,8	59,3	64,4
	61,2	59	63,9
	61,5	59,3	64,1

REGISTRO DE RUIDO DE FONDO

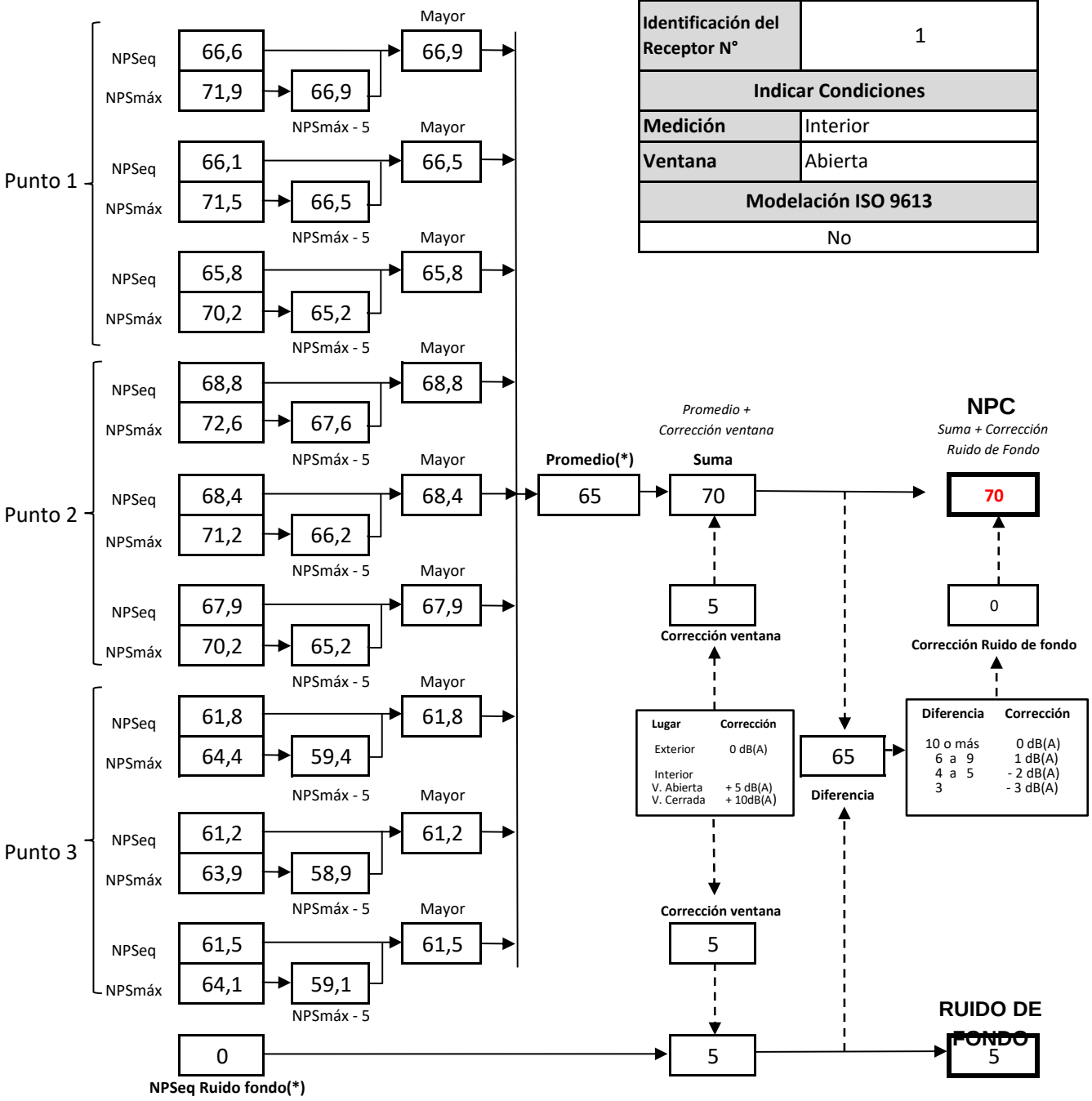
Ruido de fondo afecta la medición	☐ Si	☑ No	
Fecha:		Hora:	

	5'	10'	15'	20'	25'	30'
NPSeq						

Observaciones:
En Vicuña Mackenna se encontraba instalada una feria libre, sin embargo, no afecto a la toma de medición ya que los ruidos molestos se encuentran ubicados en la parte trasera de la vivienda. Los ruidos provienen de herramientas de construcción, como aplanadora, serrucho, taladro, entre otros.

FICHA DE EVALUACIÓN DE NIVELES DE RUIDO

Información del Receptor	
Identificación del Receptor N°	1
Indicar Condiciones	
Medición	Interior
Ventana	Abierta
Modelación ISO 9613	
No	



(*) Aproximar a números enteros

REPORTE TÉCNICO DECRETO SUPREMO N°38/11 DEL MINISTERIO DEL MEDIO AMBIENTE

Establece Norma de Emisión de Ruidos Generados por Fuentes que Indica

FICHA DE EVALUACIÓN DE NIVELES DE RUIDO

TABLA DE EVALUACIÓN

Receptor N°	NPC [dBA]	Ruido de Fondo [dBA]	Zona DS N°38	Periodo (Diurno/Nocturno)	Límite [dBA]	Estado (Supera/No Supera)
1	70	0	III	Diurno	65	Supera
			Seleccione	Seleccione	-	-
			Seleccione	Seleccione	-	-
			Seleccione	Seleccione	-	-
			Seleccione	Seleccione	-	-
			Seleccione	Seleccione	-	-
			Seleccione	Seleccione	-	-
			Seleccione	Seleccione	-	-
			Seleccione	Seleccione	-	-
			Seleccione	Seleccione	-	-

OBSERVACIONES

ANEXOS

N°	Descripción
1	Certificado de calibracion del sonometro
2	Certificado de calibracion del calibrador acustico

RESPONSABLE DEL REPORTE (Llenar sólo ETFA)

Fecha del reporte	
Nombre Representante Legal	
Firma Representante Legal	

Calibration Certificate

Certificate Number 2019013841

Customer:

Sistemas De Instrumentacion
Concha Y Toro NO 65
Santiago-Centro
Santiago, , Chile

Model Number	LxT2	***Procedure Number***	D0001.8384		
Serial Number	0005313	***Technician***	Ron Harris		
Test Results	**Pass**	***Calibration Date***	13 Nov 2019		
Initial Condition	As Manufactured	***Calibration Due***	13 Nov 2021		
Description	SoundTrack LxT Class 2 Class 2 Sound Level Meter Firmware Revision: 2.402	***Temperature***	23.51	°C	± 0.25 °C
		Humidity	49.3	%RH	± 2.0 %RH
		Static Pressure	86.67	kPa	± 0.13 kPa

Evaluation Method

Tested with:

Larson Davis PRMLxT2B. S/N 056115
PCB 375B02. S/N 011772
Larson Davis CAL200. S/N 9079
Larson Davis CAL291. S/N 0108

Data reported in dB re 20 µPa.

Compliance Standards

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

IEC 60651:2001 Type 2	ANSI S1.4-2014 Class 2
IEC 60804:2000 Type 2	ANSI S1.4 (R2006) Type 2
IEC 61252:2002	ANSI S1.11 (R2009) Class 2
IEC 61260:2001 Class 2	ANSI S1.25 (R2007)
IEC 61672:2013 Class 2	ANSI S1.43 (R2007) Type 2

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 17025:2005.
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.

Correction data from Larson Davis LxT Manual for SoundTrack LxT & SoundExpert Lxt, I770.01 Rev J Supporting Firmware Version 2.301, 2015-04-30

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ACCREDITED Cert. #3622.01

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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 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 precedures from IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part3.

No Pattern approval for IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 available.

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. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 2 specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part 3 cover only a limited subset of the 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	2019-09-18	2020-09-18	001250
SRS DS360 Ultra Low Distortion Generator	2019-06-14	2020-06-14	006311
Hart Scientific 2626-S Humidity/Temperature Sensor	2019-07-18	2020-07-18	006946
Larson Davis CAL200 Acoustic Calibrator	2019-07-22	2020-07-22	007027
Larson Davis Model 831	2019-02-22	2020-02-22	007182
PCB 377A13 1/2 inch Prepolarized Pressure Microphone	2019-03-06	2020-03-06	007185

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

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	-0.26	-0.20	-1.70	1.30	0.23	Pass
1000	0.21	0.00	-1.00	1.00	0.23	Pass
8000	-4.24	-3.00	-8.00	2.00	0.32	Pass

-- End of measurement results--

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]
A-weighted	40.38

-- End of measurement results--

-- End of Report--

Signatory: Ron Harris

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ACCREDITED Cert. #3622.01

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Calibration Certificate

Certificate Number 2019013084

Customer:
Sistemas De Instrumentacion
Concha Y Toro NO 65
Santiago-Centro
Santiago,Chile

Model Number	CAL150	***Procedure Number***	D0001.8386		
Serial Number	6266	***Technician***	Scott Montgomery		
Test Results	**Pass**	***Calibration Date***	22 Oct 2019		
Initial Condition	As Manufactured	***Calibration Due***	22 Oct 2021		
Description	Larson Davis CAL150 Calibrator	***Temperature***	22	°C	± 0.3 °C
		Humidity	30	%RH	± 3 %RH
		Static Pressure	101.3	kPa	± 1 kPa

Evaluation Method The data is aquired 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 17025:2005. **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.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Agilent 34401A DMM	08/15/2019	08/15/2020	001021
Larson Davis Model 2900 Real Time Analyzer	04/02/2019	04/02/2020	001051
Microphone Calibration System	03/04/2019	03/04/2020	005446
1/2" Preamplifier	09/17/2019	09/17/2020	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/06/2019	08/06/2020	006507
1/2 inch Microphone - RI - 200V	11/12/2018	11/12/2019	006511
Pressure Transducer	06/24/2019	06/24/2020	007310

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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	113.70	114.30	0.14	Pass
94	101.3	94.01	93.70	94.30	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	101.2	1,000.23	990.00	1,010.00	0.20	Pass
94	101.3	1,000.19	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	0.44	0.00	2.00	0.25 ‡	Pass
94	101.3	0.45	0.00	2.00	0.25 ‡	Pass

-- End of measurement results--

Level Change Over Pressure

Tested at: 114 dB, 23 °C, 44 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
108.0	107.9	-0.02	-0.40	0.40	0.04 ‡	Pass
101.3	101.4	0.00	-0.40	0.40	0.04 ‡	Pass
92.0	92.0	0.02	-0.40	0.40	0.04 ‡	Pass
83.0	83.0	0.01	-0.40	0.40	0.04 ‡	Pass
74.0	74.0	-0.02	-0.40	0.40	0.04 ‡	Pass
65.0	65.1	-0.10	-0.40	0.40	0.04 ‡	Pass

-- End of measurement results--

Frequency Change Over Pressure

Tested at: 114 dB, 23 °C, 44 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [Hz]	Lower limit [Hz]	Upper limit [Hz]	Expanded Uncertainty [Hz]	Result
108.0	107.9	-0.01	-10.00	10.00	0.20 ‡	Pass
101.3	101.4	0.00	-10.00	10.00	0.20 ‡	Pass
92.0	92.0	0.00	-10.00	10.00	0.20 ‡	Pass
83.0	83.0	0.03	-10.00	10.00	0.20 ‡	Pass
74.0	74.0	0.06	-10.00	10.00	0.20 ‡	Pass
65.0	65.1	0.07	-10.00	10.00	0.20 ‡	Pass

-- End of measurement results--

Certificate Number 2019013084

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

Tested at: 114 dB, 23 °C, 44 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [%]	Lower limit [%]	Upper limit [%]	Expanded Uncertainty [%]	Result
108.0	107.9	0.43	0.00	2.00	0.25 ‡	Pass
101.3	101.4	0.43	0.00	2.00	0.25 ‡	Pass
92.0	92.0	0.45	0.00	2.00	0.25 ‡	Pass
83.0	83.0	0.47	0.00	2.00	0.25 ‡	Pass
74.0	74.0	0.49	0.00	2.00	0.25 ‡	Pass
65.0	65.1	0.52	0.00	2.00	0.25 ‡	Pass

-- End of measurement results--

Signatory: *Scott Montgomery*

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11/15/2019 2:31:12PM

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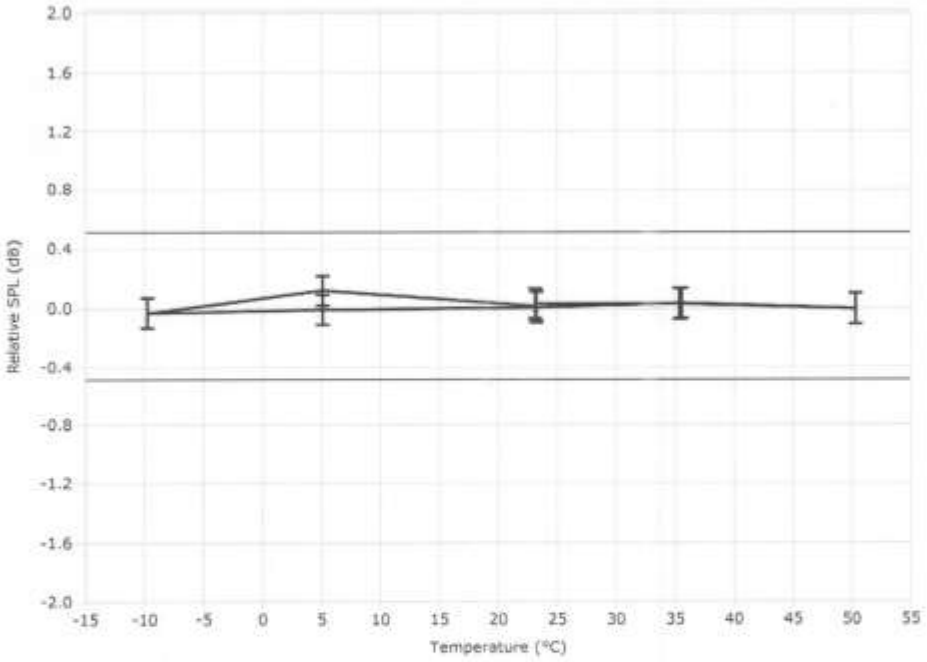
D0001.8410 Rev. B

Model CAL150 Relative SPL vs. Temperature

Larson Davis Model CAL150 Serial Number: 6266

Model CAL150 Relative SPL vs. Temperature at 50% RH.
A 2559 Mic (SN: 2912) with a PRM902 Preamp (SN: 5719), station 7 was used to check the levels.

Test Date: 12 Aug 2019 8:04:23 AM



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

Sequence File: CAL200.SEQ

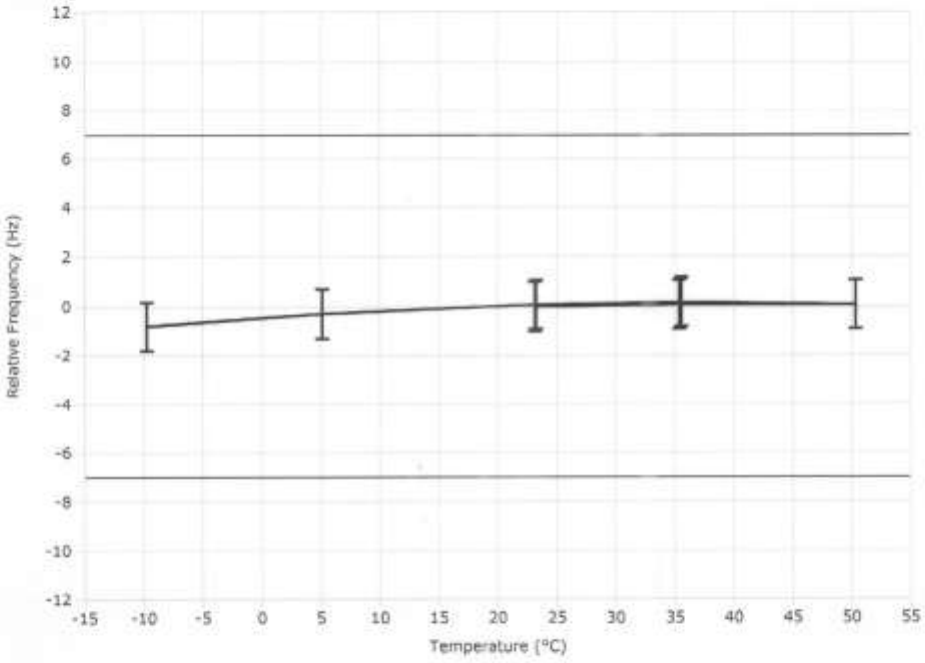
Test Location: Larson Davis, a division of PCB Piezotronics, Inc.
1681 West 820 North, Provo, Utah 84601
Tel: 716 684-0001 www.LarsonDavis.com

Model CAL150 Relative Frequency vs. Temperature

Larson Davis Model CAL150 Serial Number: 6266

Model CAL150 Relative Frequency vs. Temperature at 50% RH.
A 2559 Mic (SN: 2912) with a PRM902 Preamp (SN: 5719), station 7 was used to check the levels.

Test Date: 12 Aug 2019 8:04:23 AM



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

Sequence File: CAL200.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