



An ISO 17025-2017 registered company

# Certificate of Calibration

 Reference No.:  
32916-SEDL-BIP030006


Certificate #3035.01

## Instrument Identification

<b>Manufacturer:</b>	Quest	<b>Calibration Date:</b>	January 22, 2020
<b>Model Number:</b>	SE/DL	<b>Date of Issue:</b>	January 27, 2020
<b>Serial Number:</b>	BIP030006	<b>Calibration Due Date:</b>	January 22, 2022
<b>Service Order:</b>	32916	<b>Customer Name:</b>	Gruentec Cia Ltda.
<b>Reference Number:</b>	32916-SEDL-BIP030006	<b>Customer Address:</b>	San Juan de Cumbaya, Eloy Alfaro S7-157 y Belisario Quevedo

CIH Equipment Company Inc. certifies that the instrument listed above meets or exceeds manufacturing tolerance limits as stated in the referenced test procedure (unless otherwise noted). This instrument has been calibrated using standards with accuracies traceable to the National Institute of Standards and Technology. CIH Equipment Company Inc. calibration system is A2LA accredited to ISO/IEC 17025-2017, ANSI/NCSL Z540-1-1994. This report may not be reproduced, except in full, without the written approval CIH Equipment Company Inc. Unless stated otherwise; the expanded measurement uncertainty of the measurement process does not exceed 25% of the tolerance allowed for the individual characteristics measured. A coverage factor of  $k=2$  has been applied to the standard uncertainty to express the expanded uncertainty at 95% confidence level. This calibration was done by comparing the unit under test to the listed calibration standards, there was no sampling used in this calibration. The results reported herein apply only to the calibration of the items described above and no limitations of use apply to the calibrated unit. A PASS (in tolerance) or FAIL (out of tolerance) result indicates all measured values fall within or outside unmodified limits. The statement of compliance does not take the reported measurement uncertainty into account. In addition, reported uncertainties do not include instabilities due to transportation, usage, passage of time etc.

### Calibration Standards Used

Manufacturer	Description	Model	Serial Number	Certificate Number	Due Date
GRAS	Piston Phone	42AA	16295	43146	July 1, 2020
Stanford Research	Function Generator	DS360	33001	A3361766	October 8, 2020
Fluke	Multimeter	8840A/AF	4079041	A3359780	October 7, 2020

Certified By:

  
Tyler Rutherford - Calibration Technician

Date:

Jan 22, 2020



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# Calibration Data

Reference No.:  
32916-SEDL-BIP030006



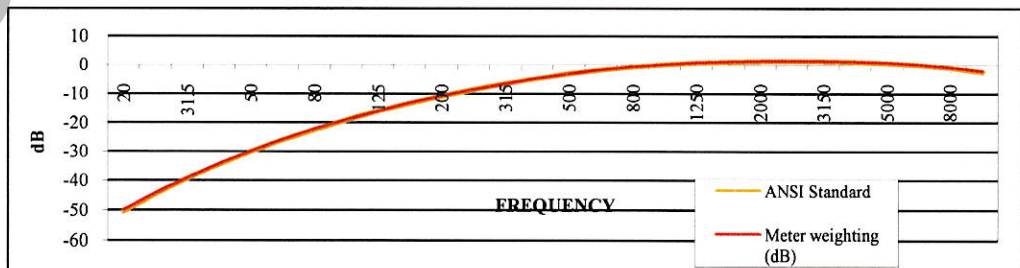
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## AS FOUND DATA

<b>Instrument Received</b>	In Tolerance
<b>Temperature</b>	73.8 °F
<b>Relative Humidity</b>	29 %RH
<b>Barometric Pressure</b>	30.14 inHg
<b>Test Procedure</b>	Acoustics - WS-0101J

Frequency (Hz)	Meter Actual Display(dB)	Meter weighting (dB)	ANSI Standard	Tolerance	Difference	Pass/Fail
20	44.1	-49.9	-50.5	± 2.50	0.6	Pass
25	49.7	-44.3	-44.7	± 2.00	0.4	Pass
31.5	54.8	-39.2	-39.4	± 1.50	0.2	Pass
40	59.7	-34.3	-34.6	± 1.50	0.3	Pass
50	64.0	-30.0	-30.2	± 1.00	0.2	Pass
63	68.0	-26.0	-26.2	± 1.00	0.2	Pass
80	71.8	-22.2	-22.5	± 1.00	0.3	Pass
100	75.0	-19.0	-19.1	± 1.00	0.1	Pass
125	77.9	-16.1	-16.1	± 1.00	0.0	Pass
160	80.8	-13.2	-13.4	± 1.00	0.2	Pass
200	83.2	-10.8	-10.9	± 1.00	0.1	Pass
250	85.4	-8.6	-8.6	± 1.00	0.0	Pass
315	87.4	-6.6	-6.6	± 1.00	0.0	Pass
400	89.3	-4.7	-4.8	± 1.00	0.1	Pass
500	90.8	-3.2	-3.2	± 1.00	0.0	Pass
630	92.2	-1.8	-1.9	± 1.00	0.1	Pass
800	93.3	-0.7	-0.8	± 1.00	0.1	Pass
1000	94.1	0.1	0.0	± 1.00	0.1	Pass
1250	94.7	0.7	0.6	± 1.00	0.1	Pass
1600	95.1	1.1	1.0	± 1.00	0.1	Pass
2000	95.3	1.3	1.2	± 1.00	0.1	Pass
2500	95.3	1.3	1.3	± 1.00	0.0	Pass
3150	95.3	1.3	1.2	± 1.00	0.1	Pass
4000	95.1	1.1	1.0	± 1.00	0.1	Pass
5000	94.7	0.7	0.5	± 1.50	0.2	Pass
6300	94.1	0.1	-0.1	± 2.00	0.2	Pass
8000	93.1	-0.9	-1.1	± 3.00	0.2	Pass
10000	91.8	-2.2	-2.5	± 4.00	0.3	Pass

Response	Frequency vs Level
	500 (Hz) 91.2 (dB)
	1000 (Hz) 94.1 (dB)
	2000 (Hz) 95.7 (dB)



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### Calibration Data

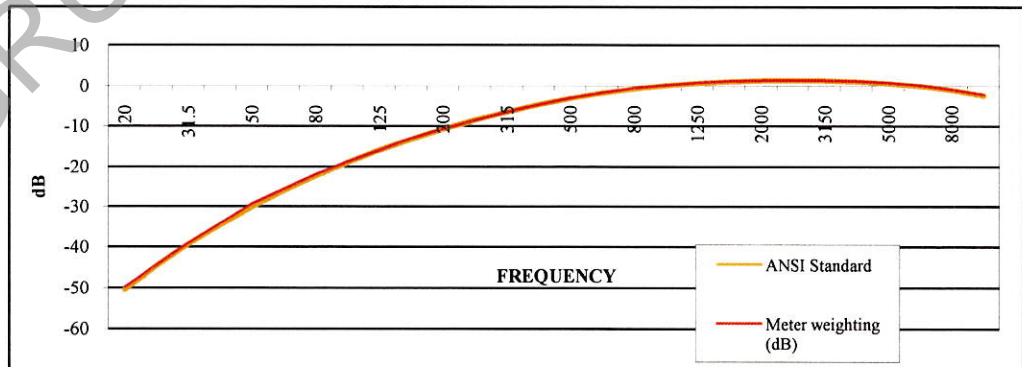
Reference No.:  
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### AS FOUND DATA

Frequency (Hz)	Meter Actual Display(dB)	Meter weighting (dB)	ANSI Standard	Tolerance	Difference	Pass/Fail
20	64.2	-49.8	-50.5	± 2.50	0.7	Pass
25	69.5	-44.5	-44.7	± 2.00	0.2	Pass
31.5	74.8	-39.2	-39.4	± 1.50	0.2	Pass
40	79.8	-34.2	-34.6	± 1.50	0.4	Pass
50	84.6	-29.4	-30.2	± 1.00	0.8	Pass
63	88.3	-25.7	-26.2	± 1.00	0.5	Pass
80	92.0	-22.0	-22.5	± 1.00	0.5	Pass
100	95.1	-18.9	-19.1	± 1.00	0.2	Pass
125	97.9	-16.1	-16.1	± 1.00	0.0	Pass
160	100.8	-13.2	-13.4	± 1.00	0.2	Pass
200	103.2	-10.8	-10.9	± 1.00	0.1	Pass
250	105.3	-8.7	-8.6	± 1.00	-0.1	Pass
315	107.4	-6.6	-6.6	± 1.00	0.0	Pass
400	109.2	-4.8	-4.8	± 1.00	0.0	Pass
500	110.9	-3.1	-3.2	± 1.00	0.1	Pass
630	112.2	-1.8	-1.9	± 1.00	0.1	Pass
800	113.4	-0.6	-0.8	± 1.00	0.2	Pass
1000	114.1	0.1	0.0	± 1.00	0.1	Pass
1250	114.7	0.7	0.6	± 1.00	0.1	Pass
1600	115.1	1.1	1.0	± 1.00	0.1	Pass
2000	115.3	1.3	1.2	± 1.00	0.1	Pass
2500	115.4	1.4	1.3	± 1.00	0.1	Pass
3150	115.3	1.3	1.2	± 1.00	0.1	Pass
4000	115.1	1.1	1.0	± 1.00	0.1	Pass
5000	114.7	0.7	0.5	± 1.50	0.2	Pass
6300	114.1	0.1	-0.1	± 2.00	0.2	Pass
8000	113.1	-0.9	-1.1	± 3.00	0.2	Pass
10000	111.8	-2.2	-2.5	± 4.00	0.3	Pass



Response	Frequency vs Level	
	500 (Hz)	110.6 (dB)
	1000 (Hz)	114.2 (dB)
2000 (Hz)	115.2 (dB)	

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### Calibration Data

Reference No.:  
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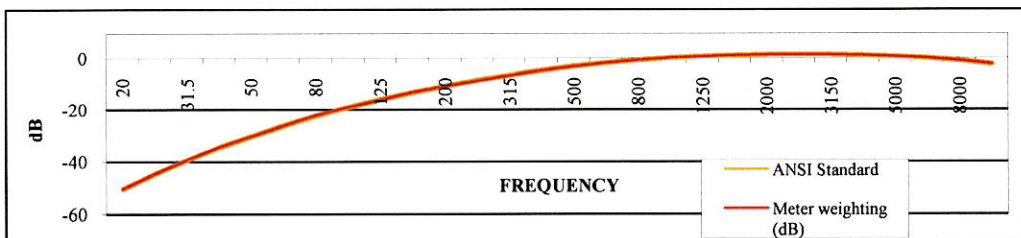
Certificate #3035.01

#### AS LEFT DATA

<b>Instrument Returned</b>	In Tolerance
<b>Temperature</b>	74.1 °F
<b>Relative Humidity</b>	29 %RH
<b>Barometric Pressure</b>	30.12 inHg
<b>Test Procedure</b>	SLM - WS-0105H

Frequency (Hz)	Meter Actual Display (dB)	Meter weighting (dB)	ANSI Standard	Tolerance	Difference	Uncertainty (dB)	Pass/Fail
20	43.6	-50.4	-50.5	± 2.50	0.1	4.83E-01	Pass
25	49.3	-44.7	-44.7	± 2.00	0.0	5.46E-01	Pass
31.5	54.6	-39.4	-39.4	± 1.50	0.0	6.05E-01	Pass
40	59.6	-34.4	-34.6	± 1.50	0.2	6.61E-01	Pass
50	63.8	-30.2	-30.2	± 1.00	0.0	7.07E-01	Pass
63	67.8	-26.2	-26.2	± 1.00	0.0	7.51E-01	Pass
80	71.7	-22.3	-22.5	± 1.00	0.2	7.95E-01	Pass
100	74.9	-19.1	-19.1	± 1.00	0.0	8.30E-01	Pass
125	77.8	-16.2	-16.1	± 1.00	-0.1	8.62E-01	Pass
160	80.7	-13.3	-13.4	± 1.00	0.1	8.94E-01	Pass
200	83.1	-10.9	-10.9	± 1.00	0.0	9.21E-01	Pass
250	85.2	-8.8	-8.6	± 1.00	-0.2	9.44E-01	Pass
315	87.3	-6.7	-6.6	± 1.00	-0.1	9.68E-01	Pass
400	89.2	-4.8	-4.8	± 1.00	0.0	9.89E-01	Pass
500	90.7	-3.3	-3.2	± 1.00	-0.1	1.01E+00	Pass
630	92.0	-2.0	-1.9	± 1.00	-0.1	1.02E+00	Pass
800	93.2	-0.8	-0.8	± 1.00	0.0	1.03E+00	Pass
1000	94.0	0.0	0.0	± 1.00	0.0	1.04E+00	Pass
1250	94.5	0.5	0.6	± 1.00	-0.1	1.05E+00	Pass
1600	95.0	1.0	1.0	± 1.00	0.0	1.05E+00	Pass
2000	95.2	1.2	1.2	± 1.00	0.0	1.06E+00	Pass
2500	95.2	1.2	1.3	± 1.00	-0.1	1.06E+00	Pass
3150	95.2	1.2	1.2	± 1.00	0.0	1.06E+00	Pass
4000	95.0	1.0	1.0	± 1.00	0.0	1.05E+00	Pass
5000	94.5	0.5	0.5	± 1.50	0.0	1.05E+00	Pass
6300	93.9	-0.1	-0.1	± 2.00	0.0	1.04E+00	Pass
8000	92.9	-1.1	-1.1	± 3.00	0.0	1.03E+00	Pass
10000	91.6	-2.4	-2.5	± 4.00	0.1	1.02E+00	Pass

Response	Frequency vs Level	
	500 (Hz)	91.0 (dB)
	1000 (Hz)	94.0 (dB)
	2000 (Hz)	95.2 (dB)



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## Calibration Data

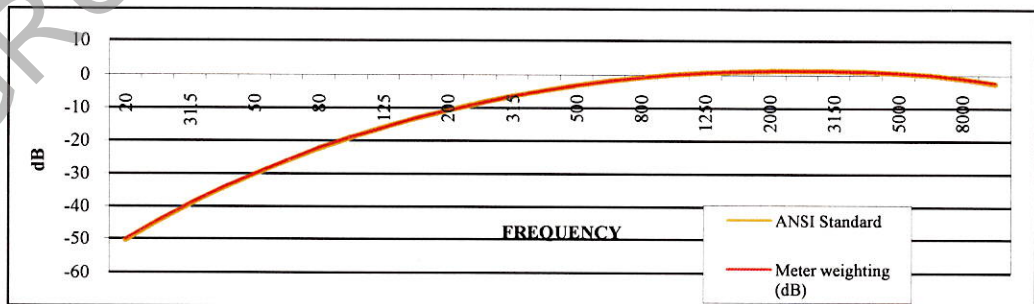
Reference No.:  
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### AS LEFT DATA



Certificate #3035.01

Frequency (Hz)	Meter Actual Display(dB)	Meter weighting (dB)	ANSI Standard	Tolerance	Difference	Uncertainty (dB)	Pass/Fail
20	63.9	-50.1	-50.5	± 2.50	0.4	7.08E-01	Pass
25	69.5	-44.5	-44.7	± 2.00	0.2	7.70E-01	Pass
31.5	74.8	-39.2	-39.4	± 1.50	0.2	8.29E-01	Pass
40	79.7	-34.3	-34.6	± 1.50	0.3	8.83E-01	Pass
50	83.9	-30.1	-30.2	± 1.00	0.1	9.30E-01	Pass
63	88	-26.0	-26.2	± 1.00	0.2	9.75E-01	Pass
80	91.7	-22.3	-22.5	± 1.00	0.2	1.02E+00	Pass
100	95	-19.0	-19.1	± 1.00	0.1	1.05E+00	Pass
125	97.8	-16.2	-16.1	± 1.00	-0.1	1.08E+00	Pass
160	100.7	-13.3	-13.4	± 1.00	0.1	1.12E+00	Pass
200	103.1	-10.9	-10.9	± 1.00	0.0	1.14E+00	Pass
250	105.3	-8.7	-8.6	± 1.00	-0.1	1.17E+00	Pass
315	107.4	-6.6	-6.6	± 1.00	0.0	1.19E+00	Pass
400	109.2	-4.8	-4.8	± 1.00	0.0	1.21E+00	Pass
500	110.8	-3.2	-3.2	± 1.00	0.0	1.23E+00	Pass
630	112.1	-1.9	-1.9	± 1.00	0.0	1.24E+00	Pass
800	113.2	-0.8	-0.8	± 1.00	0.0	1.25E+00	Pass
1000	114.0	0.0	0.0	± 1.00	0.0	1.26E+00	Pass
1250	114.6	0.6	0.6	± 1.00	0.0	1.27E+00	Pass
1600	115.0	1.0	1.0	± 1.00	0.0	1.27E+00	Pass
2000	115.2	1.2	1.2	± 1.00	0.0	1.28E+00	Pass
2500	115.3	1.3	1.3	± 1.00	0.0	1.28E+00	Pass
3150	115.2	1.2	1.2	± 1.00	0.0	1.28E+00	Pass
4000	115.0	1.0	1.0	± 1.00	0.0	1.27E+00	Pass
5000	114.6	0.6	0.5	± 1.50	0.1	1.27E+00	Pass
6300	114.0	0.0	-0.1	± 2.00	0.1	1.26E+00	Pass
8000	113.0	-1.0	-1.1	± 3.00	0.1	1.25E+00	Pass
10000	111.7	-2.3	-2.5	± 4.00	0.2	1.24E+00	Pass



Response	Frequency vs Level
	500 (Hz)   110.9 (dB)
	1000 (Hz)   114.0 (dB)
	2000 (Hz)   115.2 (dB)

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End of Report