Updated Open-air Lagoon Show with Pyrotechnic Effects

Noise Monitoring Report (September 2024)

PREPARED FOR

Ocean Park Corporation

DATE
4 October 2024

REFERENCE
0540005

DOCUMENT DETAILS

The details entered below are automatically shown on the cover and the main page footer. PLEASE NOTE: This table must NOT be removed from this document.	
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SIGNATURE PAGE

Updated Open-air Lagoon Show with Pyrotechnic Effects

Noise Monitoring Report (September 2024)

0540005

Terence Fong
Partner

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Environmental Permit No. EP-249/2006/D

Ocean Park Master Redevelopment Project

Environmental Team Leader Certification

Reference Document/Plan

Document/~~Plan~~ to be Certified/ ~~Verified~~:	Noise Monitoring Report (September 2024)
Date of Report:	4 October 2024

Reference EP Condition

Environmental Permit Condition: 3.4

Four hard copies and one electronic copy of the monthly EM&A Reports for the construction and operation stages shall be submitted to the Director within two weeks after the end of the reporting month. The monthly EM&A Reports shall include a summary of all non-compliance with the recommendations in the EIA Report or this Permit. The submissions shall be certified by the ET Leader and verified by the IEC as complied with the requirements as set out in the EM&A Manual before submission to the Director. Additional copies of the submission shall be provided upon request by the Director.

ETL Verification

I hereby verify that the above referenced document/~~plan~~ complies with the above referenced condition of EP-249/2006/D.

Ms Mandy To

Environmental Team Leader

Date: 4 October 2024

Our ref: 0540005_ETL Verification Cert_20241004.docx

Ocean Park Master Redevelopment Project

Environmental Permit No. EP-249/2006/D - Condition 3.4

Updated Open-air Lagoon Show with Pyrotechnic Effects Monthly Noise Monitoring Report (September 2024)

Submitted by ERM-Hong Kong, Limited dated 4 October 2024

This is to verify that

Updated Open-air Lagoon Show with Pyrotechnic Effects Monthly Noise Monitoring Report (September 2024)

Submitted by ERM-Hong Kong, Limited dated 4 October 2024

Has been verified by the undersigned.

Signed _____

Ir Eric Ching
Independent Environmental Checker (IEC)
Retained by Ocean Park Corporation
pursuant to Environmental Permit No. EP-249/2006/D

Date 7 October 2024

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1. BACKGROUND

ERM-Hong Kong, Limited (ERM) has been appointed by Ocean Park Corporation (OPC) to undertake noise monitoring of the Updated Open-air Lagoon Show with Pyrotechnic Effects under the "*Repositioning and Long Term Operation Plan of Ocean Park*" (the Project) with update of design in audio system and use of Pyrotechnic Special Effect Materials (PSEM), as presented in the *Noise Review Study Report 2024* (*NRR 2024*) deposited to the Environmental Protection Department (EPD) on 6 June 2024.

1.1 PURPOSE OF THE REPORT

The Updated Open-air Lagoon Show with Pyrotechnic Effects, including *Soul of the Ocean* (*SOTO*) and *Vision of Hong Kong* (*VHK*), commenced on 6 July 2024. As stated in *NRR 2024*, noise monitoring is proposed to be conducted on the first day of the updated lagoon night, as well as by the end of July, August and September 2024. The necessity and frequency of further noise monitoring should be further reviewed afterwards.

This is the noise monitoring report which summarises the impact monitoring results for the show held in **September 2024**.

1.2 STRUCTURE OF THE REPORT

After this introductory section, the remainder of this report is arranged as follows:

Section 2: describes the noise monitoring methodology, presents and discusses the monitoring results

Section 3: presents an overall conclusion of the noise monitoring

2. NOISE MONITORING

2.1 INTRODUCTION

Noise monitoring has been carried out following the requirements given in Condition 3.1 of the Environmental Permit (EP-249/2006/D) and the updated EM&A Manual. The requirements and results are detailed in the following sections.

2.2 NOISE MONITORING REQUIREMENTS

Operational phase noise monitoring during the first operational year of the lagoon night show was completed in accordance with the approved EIA report for "*Repositioning and Long Term Operation Plan of Ocean Park*" and EM&A Manual. Nevertheless, due to update in design of audio system and the use of PSEM, as stated in *NRR 2024*, it has been proposed that noise monitoring shall be carried out on the first day of the updated lagoon show (i.e. 6 July 2024), as well as by the end of July, August and September 2024. The necessity and frequency of further noise monitoring should be further reviewed afterwards.

2.3 MONITORING LOCATIONS

Noise monitoring was conducted at five monitoring stations. These monitoring stations are identical to those adopted in the monthly noise monitoring report for the lagoon show (i.e. *SOTO* and *VHK*) of Ocean Park which launched on and off between 2020 and 2023. The locations of the five monitoring stations are indicated in **Figure 1** and presented in **Table 1** below.

TABLE 1 NOISE MONITORING STATIONS

Noise Monitoring Station	Description	Location	With or without Façade Correction
AON1	Open area adjacent to Police Training School	1.2m above street level	Without façade correction
AON2	Marriott Hotel. Ocean Park	1m from façade at roof level	With façade correction
AON3	Woodgreen Estate	1.5m above street level outside boundary wall	With façade correction
AON4	Manly Villa	1.2 above street level	With façade correction
AON5	Hau Yuen	3.0m above street level outside boundary wall	With façade correction

2.4 MONITORING PARAMETERS

NOISE LEVEL OF SHOW

Measurements of $L_{Aeq\ (5min)}$ readings were carried out to monitoring the noise level during the show. The schedule of show in September 2024 is shown in **Table 2**.

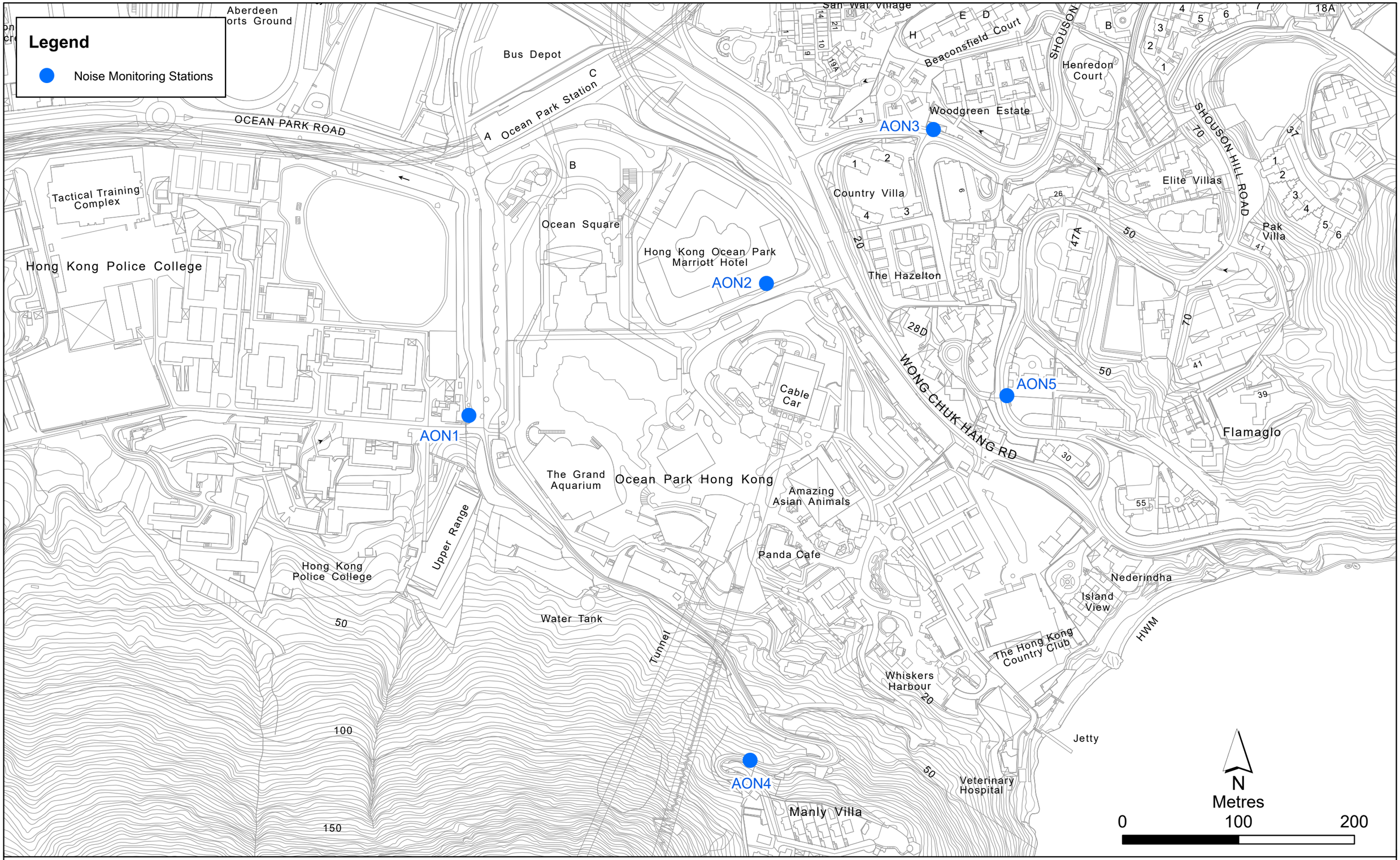

Figure 1

Noise Monitoring Locations

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Date: 1/5/2024

TABLE 2 SCHEDULE OF LAGOON NIGHT SHOW IN SEPTEMBER 2024

Description	Time
Vision of Hong Kong (VHK)	• Once between 1900 and 2200 hrs on each Saturday and Sunday, and once between 1900 and 2200 hrs on 18 September 2024 • Lasted for around 5 minutes
Soul of the Ocean (SOTO)	• Once between 1900 and 2200 hrs on each Saturday and Sunday, and once between 1900 and 2200 hrs on 18 September 2024 • Lasted for around 12 minutes

BACKGROUND NOISE LEVEL

Measurement if $L_{Aeq\ (5min)}$ were carried out before and after the show when speakers were switched off to calculate the overall background noise level at each location.

Any significant influencing factors on the measured noise levels were noted in accordance with standard acoustical principles and practices. The background-corrected noise level due to the show was computed based on the background noise level and measured noise level during the shows.

2.5 MONITORING FREQUENCY

Noise monitoring for the show has been conducted once in September 2024. The noise monitoring schedule is summarised in **Table 3**.

TABLE 3 NOISE MONITORING SCHEDULE IN SEPTEMBER 2024

Monitoring Date	Monitoring Stations
28 September 2024 (Saturday)	AON1 to AON5

2.6 MONITORING METHODOLOGY

The sound level meters and calibrators used for the noise monitoring, as listed in **Table 4** below, complies with IEC 651: 1979 and 804:1985 (Type 1) or equivalent international standards.

TABLE 4 NOISE MONITORING EQUIPMENT

Noise Monitoring Station	Monitoring Equipment
AON1	Rion NL-52 Sound Level Meter, CAL200 Calibrator
AON2	Rion NL-52 Sound Level Meter, CAL200 Calibrator
AON3	Rion NL-52 Sound Level Meter, CAL200 Calibrator
AON4	Rion NL-52 Sound Level Meter, CAL200 Calibrator
AON5	Rion NL-52 Sound Level Meter, CAL200 Calibrator

Noise monitoring was conducted with reference to the calibration and measurement procedures as stated in the *Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites* (*IND-TM*) issued under the *Noise Control Ordinance* (*NCO*). Immediately prior to and following each noise measurement the accuracy of the monitoring equipment was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements were accepted as the calibration levels from before and after the noise measurement agree to within 1.0 dB.

The sound level meters and acoustic calibrators have been calibrated by a HOKLAS accredited laboratory every two years. The relevant calibration certificates are presented in **Appendix A**.

Noise measurements were conducted without the presence of fog and rain, and with steady wind speed and gusts not exceeding 5 ms^{-1} and 10 ms^{-1}, respectively in accordance with international standards and practices (i.e. ISO 11819-1:1997 and ISO/FDIS 13472-1:2001). Measurement of L_{Aeq}, L_{10}, L_{90}, L_{max} and L_{min} has been recorded for reference.

If measured noise level is affected by other noise sources at the monitoring station, e.g. traffic noise, such that the measured noise level is dominated by noise source other than the show, noise data will be discarded.

If measured noise level for the show is below or equal to the measured background noise level, the noise from the show is considered as insignificant and hence negligible at the monitoring location.

2.7 COMPLIANCE ASSESSMENT

FIXED PLANT NOISE CRITERIA

As recommended in the approved EIA Report and stated in the EM&A Manual, OPC will follow the Action and Limit (A/L) Levels as recommended in the approved EIA Report and EM&A Manual which are summarised in **Table 5**. In case exceedances are resulted from cumulative impacts, all step stipulated in the Event/Action Plan shall be followed.

TABLE 5 ACTION AND LIMIT LEVELS FOR ENTERTAINMENT NOISE

Noise Monitoring Station	Action Level	Limit Level
AON1	When documented complaint is received from any of the sensitive receivers	$L_{eq\ (5min)}$ 60 dB(A)
AON2		$L_{eq\ (5min)}$ 60 dB(A)
AON3		$L_{eq\ (5min)}$ 55 dB(A)
AON4		$L_{eq\ (5min)}$ 55 dB(A)
AON5		$L_{eq\ (5min)}$ 55 dB(A)

NOISE CRITERIA FOR OUTDOOR ACTIVITIES

The same set of noise criteria for outdoor activities as per the monthly noise monitoring reports prepared in 2020 to 2023 was adopted. The noise levels from the outdoor activities

should not be more than 5dB(A) above the prevailing background noise level during the daytime and evening periods (0700-2300 hrs), as measured at 1m from the exterior building façade of the most affected NSRs for regular outdoor activities. For the night-time period (2300-0700 hrs of the next day), the noise from outdoor events should not be audible at the nearby NSRs.

2.8 RESULTS OF NOISE MONITORING

The results of noise monitoring conducted on 28 September 2024 are given in **Appendix B**, with summary of compliance shown in **Table 6**. Photographs taken at the monitoring stations are shown in **Appendix C**.

TABLE 6 COMPLIANCE OF NOISE MONITORING

Date and Show	Noise Monitoring Station	Compliance		
		<BGL+5	Limit Level	Not Applicable
28 September 2024 (SOTO)	AON1	Yes	Yes	-
	AON2	Yes	Yes	-
	AON3	Yes	Yes	-
	AON4	Yes	Yes	-
	AON5	-	-	N/A[a]
28 September 2024 (VHK)	AON1	Yes	Yes	-
	AON2	Yes	Yes	-
	AON3	-	-	N/A[a]
	AON4	Yes	Yes	-
	AON5	Yes	Yes	-

Note:

[a] Measured noise data was considered being affected by other significant noise sources, i.e., traffic and idling heavy vehicle

2.9 SUMMARY OF NOISE EXCEEDANCES

No record of noise exceedances during the show in September 2024.

3. CONCLUSION

This is the noise monitoring report which summarises the noise monitoring results during the lagoon night show in **September 2024**.

The noise monitoring was carried out at five designated monitoring stations.

No noise exceedance has been recorded.

APPENDIX A CALIBRATION CERTIFICATES OF THE NOISE MEASUREMENT EQUIPMENT

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C243578
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC24-0986) Date of Receipt / 收件日期 : 4 June 2024

Description / 儀器名稱 : Sound Level Meter
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00643049
Supplied By / 委託者 : Envirotech Services Co.
Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,
New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration

DATE OF TEST / 測試日期 : 30 June 2024

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed specified limits. (after adjustment)
These limits refer to manufacturer's published tolerances as requested by the customer.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong
Assistant Engineer

Certified By 核證 : K C Lee
Engineer

Date of Issue 簽發日期 : 3 July 2024

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 - 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C243578
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using the internal standard (After Adjustment) was performed before the test from 6.1.1.2 to 6.3.2.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C240212
CL281	Multifunction Acoustic Calibrator	CDK2302738

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	* 91.3	± 1.1

* Out of IEC 61672 Class 1 Limit

6.1.1.2 After Adjustment

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.0	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L_A	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.1
				114.00		114.2

IEC 61672 Class 1 Limit : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

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Certificate No. : C243578
證書編號

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.0	Ref.
			Slow			94.0	± 0.3

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_A	A	Fast	94.00	63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.5
					250 Hz	85.3	-8.6 ± 1.4
					500 Hz	90.8	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.6
					4 kHz	95.0	+1.0 ± 1.6
					8 kHz	93.0	-1.1 (+2.1 ; -3.1)
					16 kHz	86.0	-6.6 (+3.5 ; -17.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_C	C	Fast	94.00	63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	91.1	-3.0 (+2.1 ; -3.1)
					16 kHz	84.1	-8.5 (+3.5 ; -17.0)

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C243578
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 10446

- Mfr's Limit : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	16 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 - 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C240423
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序号編號 : IC24-0020) Date of Receipt / 收件日期 : 5 January 2024

Description / 儀器名稱	:	Precision Acoustic Calibrator
Manufacturer / 製造商	:	LARSON DAVIS
Model No. / 型號	:	CAL200
Serial No. / 編號	:	16172
Supplied By / 委託者	:	Envirotech Services Co. Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun, New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 24 January 2024

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed specified limits.
These limits refer to manufacturer's published tolerances as requested by the customer.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee
Engineer

Certified By 核證 : H C Chan
Engineer

Date of Issue 簽發日期 : 24 January 2024

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 - 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C240423
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C233799
CL281	Multifunction Acoustic Calibrator	CDK2302738
TST150A	Measuring Amplifier	C221750

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Limit (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.90	± 0.2	± 0.20
114 dB, 1 kHz	113.90		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Limit	Uncertainty of Measured Value (Hz)
1	1.000	1 kHz ± 1 %	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C237486
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC23-2475) Date of Receipt / 收件日期 : 8 December 2023

Description / 儀器名稱	:	Sound Level Meter
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NL-52
Serial No. / 編號	:	01010406
Supplied By / 委託者	:	Envirotech Services Co. Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun, New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 31 December 2023

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed specified limits.
These limits refer to manufacturer's published tolerances as requested by the customer.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong, Assistant Engineer

Certified By 核證 : K C Lee, Engineer

Date of Issue 簽發日期 : 3 January 2024

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 - 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C237486
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C230306
CL281	Multifunction Acoustic Calibrator	CDK2302738

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.0	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L_A	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.1
				114.00		114.0

IEC 61672 Class 1 Limit : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.0	Ref.
			Slow			94.0	± 0.3

Certificate of Calibration
校正證書

Certificate No. : C237486
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_A	A	Fast	94.00	63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.5
					250 Hz	85.3	-8.6 ± 1.4
					500 Hz	90.7	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.6
					4 kHz	95.0	+1.0 ± 1.6
					8 kHz	93.0	-1.1 (+2.1 ; -3.1)
					16 kHz	86.0	-6.6 (+3.5 ; -17.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_C	C	Fast	94.00	63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	91.1	-3.0 (+2.1 ; -3.1)
					16 kHz	84.1	-8.5 (+3.5 ; -17.0)

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 - 校正及檢測實驗所
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Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C237486
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 13748

- Mfr's Limit : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	16 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

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Certificate of Calibration

for

Description:	***Sound Level Calibrator***
Manufacturer:	***Larson Davis***
Type No.:	***CAL200***
Serial No.:	***11333***

Submitted by:

Customer:	*Envirotech Services Co.*
Address:	*Rm.712, 7/F., My Loft, 9 Hoi Wing Road, Tuen Mun, Hong Kong*

Upon receipt for calibration, the instrument was found to be:

☑ **Within**
☐ **Outside**

the allowable tolerance.

The test equipments used for calibration are traceable to National Standards via:
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Date of receipt: 24 July 2024

Date of calibration: 26 July 2024

Date of NEXT calibration: 25 July 2025

Calibrated by: _____
Calibration Technician

Certified by: _____
Mr. Ng Yan Wa
Laboratory Manager

Date of issue: **26 July 2024**

ACOUSTICS AND AIR TESTING LABORATORY CO LTD (A+A)*L

Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong
Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

1. *Calibration Precautions:*

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.

2. *Calibration Specifications:*

Calibration check

3. *Calibration Conditions:*

Air Temperature:	24.3 °C
Air Pressure:	1004 hPa
Relative Humidity:	57.9 %

4. *Calibration Equipment:*

Test Equipment	Type	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV240081	HOKLAS
Sound Level Meter	RION NA-28	30721812	AV230128	HOKLAS

5. *Calibration Results*

5.1 Sound Pressure Level

Nominal value dB	Accept lower level dB	Accept upper level dB	Measured value dB
94.0	93.6	94.4	93.6

Note:
The values given in this certification only related to the values measured at the time of the calibration.

ACOUSTICS AND AIR TESTING LABORATORY CO. LTD. (A+A)*L

Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C240424
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC24-0020) Date of Receipt / 收件日期 : 5 January 2024

Description / 儀器名稱 : Sound Level Meter
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00710259
Supplied By / 委託者 : Envirotech Services Co.
Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,
New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 24 January 2024

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed specified limits.
These limits refer to manufacturer's published tolerances as requested by the customer.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee, Engineer

Certified By 核證 : H C Chan, Engineer

Date of Issue 簽發日期 : 24 January 2024

Certificate of Calibration
校正證書

Certificate No. : C240424
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C240212
CL281	Multifunction Acoustic Calibrator	CDK2302738

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.0	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L_A	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 61672 Class 1 Limit : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.0	Ref.
			Slow			94.0	± 0.3

Certificate of Calibration
校正證書

Certificate No. : C240424
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_A	A	Fast	94.00	63 Hz	67.7	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.5
					250 Hz	85.3	-8.6 ± 1.4
					500 Hz	90.7	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.6
					4 kHz	95.0	+1.0 ± 1.6
					8 kHz	92.9	-1.1 (+2.1 ; -3.1)
					16 kHz	86.0	-6.6 (+3.5 ; -17.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_C	C	Fast	94.00	63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.8	-0.2 ± 1.6
					4 kHz	93.2	-0.8 ± 1.6
					8 kHz	91.0	-3.0 (+2.1 ; -3.1)
					16 kHz	84.1	-8.5 (+3.5 ; -17.0)

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Certificate of Calibration
校正證書

Certificate No. : C240424
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 12128

- Mfr's Limit : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	16 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

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輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C237485
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC23-2475) Date of Receipt / 收件日期 : 8 December 2023

Description / 儀器名稱	:	Precision Acoustic Calibrator
Manufacturer / 製造商	:	LARSON DAVIS
Model No. / 型號	:	CAL200
Serial No. / 編號	:	15678
Supplied By / 委託者	:	Envirotech Services Co. Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun, New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 31 December 2023

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed specified limits.
These limits refer to manufacturer's published tolerances as requested by the customer.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong, Assistant Engineer

Certified By 核證 : K C Lee, Engineer

Date of Issue 簽發日期 : 3 January 2024

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C237485
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C233799
CL281	Multifunction Acoustic Calibrator	CDK2302738
TST150A	Measuring Amplifier	C221750

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Limit (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.90	± 0.2	± 0.20
114 dB, 1 kHz	113.90		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Limit	Uncertainty of Measured Value (Hz)
1	1.000	1 kHz ± 1 %	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

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輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C237046
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC23-2316) Date of Receipt / 收件日期 : 15 November 2023

Description / 儀器名稱	:	Sound Level Meter
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NL-52
Serial No. / 編號	:	00175561
Supplied By / 委託者	:	Envirotech Services Co. Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun, New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 6 December 2023

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed specified limits.
These limits refer to manufacturer's published tolerances as requested by the customer.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : C K Lo, Project Engineer

Certified By 核證 : K C Lee, Engineer

Date of Issue 簽發日期 : 6 December 2023

Certificate of Calibration
校正證書

Certificate No. : C237046
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C230306
CL281	Multifunction Acoustic Calibrator	CDK2302738

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	93.2	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L_A	A	Fast	94.00	1	93.2 (Ref.)
				104.00		103.3
				114.00		113.4

IEC 61672 Class 1 Limit : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	93.2	Ref.
			Slow			93.2	± 0.3

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
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Certificate of Calibration
校正證書

Certificate No. : C237046
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_A	A	Fast	94.00	63 Hz	66.9	-26.2 ± 1.5
					125 Hz	77.0	-16.1 ± 1.5
					250 Hz	84.5	-8.6 ± 1.4
					500 Hz	89.9	-3.2 ± 1.4
					1 kHz	93.2	Ref.
					2 kHz	94.4	+1.2 ± 1.6
					4 kHz	94.2	+1.0 ± 1.6
					8 kHz	92.1	-1.1 (+2.1 ; -3.1)
					16 kHz	85.2	-6.6 (+3.5 ; -17.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Limit (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_C	C	Fast	94.00	63 Hz	92.3	-0.8 ± 1.5
					125 Hz	93.0	-0.2 ± 1.5
					250 Hz	93.2	0.0 ± 1.4
					500 Hz	93.2	0.0 ± 1.4
					1 kHz	93.2	Ref.
					2 kHz	93.0	-0.2 ± 1.6
					4 kHz	92.4	-0.8 ± 1.6
					8 kHz	90.2	-3.0 (+2.1 ; -3.1)
					16 kHz	83.3	-8.5 (+3.5 ; -17.0)

Certificate of Calibration
校正證書

Certificate No. : C237046
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 16651

- Mfr's Limit : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	16 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C242738
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC24-0781) Date of Receipt / 收件日期 : 3 May 2024

Description / 儀器名稱 : Precision Acoustic Calibrator
Manufacturer / 製造商 : LARSON DAVIS
Model No. / 型號 : CAL200
Serial No. / 編號 : 11334
Supplied By / 委託者 : Envirotech Services Co.
Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun,
New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 19 May 2024

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed specified limits.
These limits refer to manufacturer's published or user's specified tolerances as requested by the customer.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong
Assistant Engineer

Certified By 核證 : K C Lee
Engineer

Date of Issue 簽發日期 : 20 May 2024

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C242738
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C233799
CL281	Multifunction Acoustic Calibrator	CDK2302738
TST150A	Measuring Amplifier	C241879

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	User's Limit (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.60	± 0.5	± 0.20
114 dB, 1 kHz	113.60		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Limit	Uncertainty of Measured Value (Hz)
1	1.000	1 kHz ± 1 %	± 1

Remarks : - The user's limit is a customer pre-defined operating tolerance of the UUT, suitable for one's own intended use.

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 - 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration

for

Description:	***Sound Level Meter***
Manufacturer:	***RION***
Type No.:	***NL-52 (Serial No.: 00542913)***
Microphone:	***UC-53A (Serial No.: 99995)***
Preamplifier:	***NH-25 (Serial No.:43068)***

Submitted by:

Customer:	*Envirotech Services Co.*
Address:	*Rm.712, 7/F., My Loft, 9 Hoi Wing Road, Tuen Mun, Hong Kong*

Upon receipt for calibration, the instrument was found to be:

☑ **Within (31.5Hz – 8kHz)**
☐ **Outside**

the allowable tolerance.

The test equipment used for calibration are traceable to National Standards via:
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Date of receipt: 28 August 2024

Date of calibration: 29 August 2024

Date of NEXT calibration: 28 August 2025

Calibrated by: _____
Calibration Technician

Certified by: _____
Mr. Ng Yan Wa
Laboratory Manager

Date of issue: 29 August 2024

ACOUSTICS AND AIR TESTING LABORATORY CO. LTD. (A+A)*L

Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong
Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

1. *Calibration Precaution:*

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.

2. *Calibration Conditions:*

Air Temperature: 24.6 °C
Air Pressure: 1004 hPa
Relative Humidity: 53.9 %

3. *Calibration Equipment:*

	Type	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV240081	HOKLAS

4. *Calibration Results*

Sound Pressure Level

Reference Sound Pressure Level

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.0	±0.4

Linearity

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.0	Ref
			104		104.0	±0.3
			114		114.0	±0.3

Time Weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.0	Ref
		Slow			94.0	±0.3

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Frequency Response

Linear Response

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
30-130	dB SPL	Fast	94	31.5	92.7	±2.0
				63	93.7	±1.5
				125	93.9	±1.5
				250	94.0	±1.4
				500	94.0	±1.4
				1000	94.0	Ref
				2000	93.9	±1.6
				4000	94.3	±1.6
				8000	92.4	+2.1; -3.1

A-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
30-130	dBA SPL	Fast	94	31.5	53.5	-39.4±2.0
				63	67.5	-26.2±1.5
				125	77.8	-16.1±1.5
				250	85.3	-8.6±1.4
				500	90.8	-3.2±1.4
				1000	94.0	Ref
				2000	95.2	+1.2±1.6
				4000	95.3	+1.0±1.6
				8000	91.3	-1.1+2.1; -3.1

C-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
30-130	dBC SPL	Fast	94	31.5	89.7	-3.0±2.0
				63	92.9	-0.8±1.5
				125	93.8	-0.2±1.5
				250	94.0	-0.0±1.4
				500	94.0	-0.0±1.4
				1000	94.0	Ref
				2000	93.8	-0.2±1.6
				4000	93.5	-0.8±1.6
				8000	89.4	–3.0 +2.1: –3.1

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5. *Calibration Results Applied*

The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

94 dB	31.5 Hz	± 0.10
	63 Hz	± 0.10
	125 Hz	± 0.10
	250 Hz	± 0.10
	500 Hz	± 0.10
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.10
	8000 Hz	± 0.10
104 dB	1000 Hz	± 0.05
114 dB	1000 Hz	± 0.05

The uncertainties are evaluated for a 95% confidence level.

Note:
The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)*L shall not be liable for any loss or damage resulting from the use of the equipment.

ACOUSTICS AND AIR TESTING LABORATORY CO. LTD. (A+A)*L

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Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C240965
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC24-0190) Date of Receipt / 收件日期 : 1 February 2024

Description / 儀器名稱	:	Precision Acoustic Calibrator
Manufacturer / 製造商	:	LARSON DAVIS
Model No. / 型號	:	CAL200
Serial No. / 編號	:	10227
Supplied By / 委託者	:	Envirotech Services Co. Room 712, 7/F, My Loft, 9 Hoi Wing Road, Tuen Mun, New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 25)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 22 February 2024

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By 測試 : K C Lee, Engineer

Certified By 核證 : H C Chan, Engineer

Date of Issue 簽發日期 : 22 February 2024

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 - 校正及檢測實驗所
c/o 香港新界屯門興安里 一號四樓
Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C240965
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C233799
CL281	Multifunction Acoustic Calibrator	CDK2302738
TST150A	Measuring Amplifier	C221750

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	93.90	± 0.20
114 dB, 1 kHz	113.90	

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Uncertainty of Measured Value (Hz)
1	1.000	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

APPENDIX B RESULTS OF NOISE MONITORING

Noise Measurement Field Record Sheet

Project Name / GMS No.: 0540005 OPC Noise Monitoring for Updated Lagoon Show

Noise Monitoring Station: AON1

Noise Monitoring Staff: K. C. Ho

Noise Meter Model / Identification: Rion NL-52 / 00643049

Calibrator Model / Identification: CAL200 / 16172

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
28-Sep-24	18:45	18:50	Background	68.3	-	65.3	-	-	70.3	60	-	-	-
	18:50	18:55	Background	66.0									
	18:55	19:00	Background	65.6									
	19:00	19:05	SOTO	61.8	62.4		-2.9	Negligible			Yes	Yes	-
	19:05	19:10	SOTO	63.5									
	19:10	19:15	SOTO	61.7									
	19:15	19:20	SOTO / VHK	64.0	64.4		-0.9	Negligible			Yes	Yes	-
	19:20	19:25	VHK	64.7									
	19:25	19:30	Background	64.4	-		-	-			-	-	-
	19:30	19:35	Background	60.1									
	19:35	19:40	Background	63.3									

Schedule of Event:
28-9-2024: SOTO (19:02 - 19:15), VHK (19:16 - 19:22)

Note:
(a) Average BGL was calculated using $L_{eq\ (5min)}$ 15 minutes before and after the show.
(b) Impact from the show is considered negligible when the measured noise level with the show is equal to or lower than the measured background noise level.
(c) The Schedule of Event was confirmed with OPC's staff on-site.
(d) +3 dB(A) free-field correction has been applied to monitoring results at AON1.

Noise Measurement Field Record Sheet

Project Name / GMS No.: 0540005 OPC Noise Monitoring for Updated Lagoon Show

Noise Monitoring Station: AON2

Noise Monitoring Staff: Y. P. Fai

Noise Meter Model / Identification: Rion NL-52 / 01010406

Calibrator Model / Identification: CAL200 / 11333

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
28-Sep-24	18:45	18:50	Background	64.4	-	63.2	-	-	68.2	60	-	-	-
	18:50	18:55	Background	64.3									
	18:55	19:00	Background	62.1									
	19:00	19:05	SOTO	63.7	64.0		0.8	56.4			Yes	Yes	-
	19:05	19:10	SOTO	64.4									
	19:10	19:15	SOTO	64.0									
	19:15	19:20	SOTO / VHK	65.7	64.9		1.7	59.9			Yes	Yes	-
	19:20	19:25	VHK	63.9									
	19:25	19:30	Background	62.2	-		-	-			-	-	-
	19:30	19:35	Background	63.9									
	19:35	19:40	Background	61.6									

Schedule of Event:
28-9-2024: SOTO (19:02 - 19:15), VHK (19:16 - 19:22)

Note:
(a) Average BGL was calculated using $L_{eq\ (5min)}$ 15 minutes before and after the show.
(b) Impact from the show is considered negligible when the measured noise level with the show is equal to or lower than the measured background noise level.
(c) The Schedule of Event was confirmed with OPC's staff on-site.

Noise Measurement Field Record Sheet

Project Name / GMS No.: 0540005 OPC Noise Monitoring for Updated Lagoon Show

Noise Monitoring Station: AON3

Noise Monitoring Staff: Lap Kwok

Noise Meter Model / Identification: Rion NL-52 / 00710259

Calibrator Model / Identification: CAL200 / 15678

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
28-Sep-24	18:45	18:50	Background	64.5	-	63.4	-	-	68.4	55	-	-	-
	18:50	18:55	Background	65.5									
	18:55	19:00	Background	61.9									
	19:00	19:05	SOTO	63.6	64.0		0.6	54.9			Yes	Yes	-
	19:05	19:10	SOTO	65.2									
	19:10	19:15	SOTO	62.8									
	19:15	19:20	SOTO / VHK	64.2	64.4		0.9	57.3			N/A	N/A	Dominated by traffic noise
	19:20	19:25	VHK	64.5									
	19:25	19:30	Background	63.2	-		-	-			-	-	-
	19:30	19:35	Background	62.1									
	19:35	19:40	Background	61.8									

Schedule of Event:
28-9-2024: SOTO (19:02 - 19:15), VHK (19:16 - 19:22)

Note:
(a) Average BGL was calculated using $L_{eq\ (5min)}$ 15 minutes before and after the show.
(b) Impact from the show is considered negligible when the measured noise level with the show is equal to or lower than the measured background noise level.
(c) The Schedule of Event was confirmed with OPC's staff on-site.

Noise Measurement Field Record Sheet

Project Name / GMS No.: 0540005 OPC Noise Monitoring for Updated Lagoon Show

Noise Monitoring Station: AON4

Noise Monitoring Staff: K. T. Ho

Noise Meter Model / Identification: Rion NL-52 / 00175561

Calibrator Model / Identification: CAL200 / 11334

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
28-Sep-24	18:45	18:50	Background	55.8	-	55.6	-	-	60.6	55	-	-	-
	18:50	18:55	Background	56.9									
	18:55	19:00	Background	56.4									
	19:00	19:05	SOTO	55.2	56.1		0.5	46.1			Yes	Yes	-
	19:05	19:10	SOTO	57.7									
	19:10	19:15	SOTO	54.8									
	19:15	19:20	SOTO / VHK	55.1	56.9		1.3	51.0			Yes	Yes	-
	19:20	19:25	VHK	58.2									
	19:25	19:30	Background	54.5	-		-	-			-	-	-
	19:30	19:35	Background	53.1									
	19:35	19:40	Background	56.1									

Schedule of Event:
28-9-2024: SOTO (19:02 - 19:15), VHK (19:16 - 19:22)

Note:
(a) Average BGL was calculated using $L_{eq\ (5min)}$ 15 minutes before and after the show.
(b) Impact from the show is considered negligible when the measured noise level with the show is equal to or lower than the measured background noise level.
(c) The Schedule of Event was confirmed with OPC's staff on-site.

Noise Measurement Field Record Sheet

Project Name / GMS No.: 0540005 OPC Noise Monitoring for Updated Lagoon Show

Noise Monitoring Station: AON5

Noise Monitoring Staff: Magnum Fan

Noise Meter Model / Identification: Rion NL-52 / 00542913

Calibrator Model / Identification: CAL200 / 10227

Date	Start	End Time	Monitoring Event	Leq, 5min	Leq, 15min	Average BGL	Noise Level with Show - BGL	BG-corrected Leq, 15min	NCO (BGL+5)	Limit Level	Compliance		Remarks
											NCO (BGL+5)	Limit Level	
28-Sep-24	18:45	18:50	Background	58.4	-	57.0	-	-	62.0	55	-	-	-
	18:50	18:55	Background	57.5									
	18:55	19:00	Background	56.2									
	19:00	19:05	SOTO	62.1	60.9		3.9	58.6			N/A	N/A	Dominated by traffic noise
	19:05	19:10	SOTO	58.6									
	19:10	19:15	SOTO	61.3									
	19:15	19:20	SOTO / VHK	58.1	57.6		0.6	48.5			Yes	Yes	-
	19:20	19:25	VHK	57.0									
	19:25	19:30	Background	52.1	-		-	-			-	-	-
	19:30	19:35	Background	56.3									
	19:35	19:40	Background	58.8									

Schedule of Event:
28-9-2024: SOTO (19:02 - 19:15), VHK (19:16 - 19:22)

Note:
(a) Average BGL was calculated using $L_{eq\ (5min)}$ 15 minutes before and after the show.
(b) Impact from the show is considered negligible when the measured noise level with the show is equal to or lower than the measured background noise level.
(c) The Schedule of Event was confirmed with OPC's staff on-site.

APPENDIX C PHOTOGRAPHS OF THE MONITORING STATIONS

Appendix C

Open Area adjacent to Police Training School (AON1)

DATE: 28/09/2024

ERM

Appendix C

Marriot Hotel, Ocean Park (AON2)

DATE: 28/09/2024

Appendix C

Woodgreen Estate (AON3)

DATE: 28/09/2024

Appendix C

Manly Villa (AON4)

DATE: 28/09/2024

Appendix C

Hau Yuen (AON5)

DATE: 28/09/2024

ERM HAS OVER 160 OFFICES ACROSS THE FOLLOWING COUNTRIES AND TERRITORIES WORLDWIDE

Argentina
Australia
Belgium
Brazil
Canada
China
Colombia
France
Germany
Ghana
Guyana
Hong Kong
India
Indonesia
Ireland
Italy
Japan
Kazakhstan
Kenya
Malaysia
Mexico
Mozambique
The Netherlands
New Zealand
Peru
Poland
Portugal
Puerto Rico
Romania
Senegal
Singapore
South Africa
South Korea
Spain
Switzerland
Taiwan
Tanzania
Thailand
UAE
UK
US
Vietnam

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