

APPENDIX C
COPIES OF CALIBRATION
CERTIFICATES



東恒測試顧問有限公司

AQUALITY TESTCONSULT LIMITED

香港新界粉嶺坪輦路啟芳園11A&B號

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CERTIFICATE OF CALIBRATION

Ka Shing Facility Management Ltd. Flat C, 14/F, Jing Ho Industrial Building, 78- 84 Wang Lung Street, Tsuen Wan, N.T.	Test Report No.	250512MCA-1P
	Date of Issue	12-May-25
	Date of Testing	11-May-25
	Page	1 of 1

Item for Calibration

Description : Laser Dust Monitor

Manufacturer : Met One Instruments, Inc.

Model No. : AEROCET-831

Serial No. : D12641

Standard Equipment

Description : High Volume Sampler / Calibration Orifice

Manufacturer : Tisch Environmental, Inc.

Model No. : TE-5170 / TE-5025A

Serial No. : 3476 / 4088

Last Calibration : 24-AUG-24 / 15-OCT-24

Date	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration Standard Equipment (mg/m3)	Concentration Calibrated Equipment (mg/m3)
11-May-25	19:00	24.8	1010.1	0.0612	0.0627
11-May-25	20:05	24.8	1010.1	0.0560	0.0563
11-May-25	21:10	24.8	1010.1	0.0582	0.0598

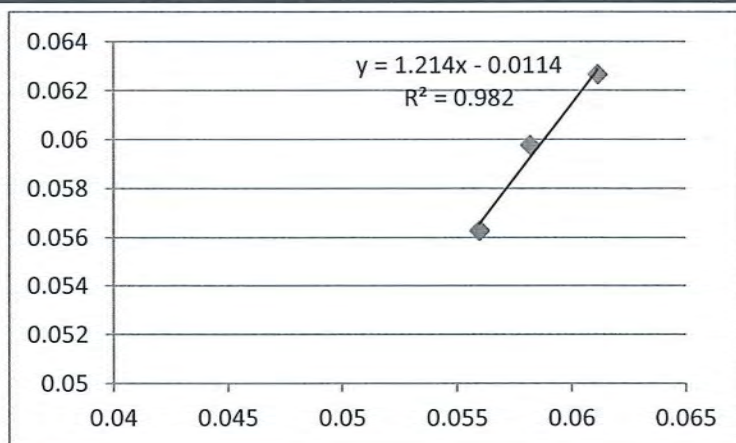
By Linear Regression of Y or X

Slope : 1.2140

Correlation Coefficient : 0.9820

K-Factor : 0.9817

Validity of Calibration : 10-May-26



Recorded by : Jessica Liu

Signature:

Date: 11-May-25

Checked by : S Tang

Signature:

Date: 11-May-25



Certificate of Calibration

Calibration Certification Information

Cal. Date: September 9, 2025 Rootsmeter S/N: 438320 Ta: 294 °K
Operator: Jim Tisch Pa: 754.9 mm Hg
Calibration Model #: TE-5025A Calibrator S/N: 4088

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4460	3.2	2.00
2	3	4	1	1.0320	6.4	4.00
3	5	6	1	0.9210	8.0	5.00
4	7	8	1	0.8840	8.8	5.50
5	9	10	1	0.7240	12.8	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (y-axis)
1.0025	0.6933	1.4190	0.9958	0.6886	0.8826
0.9983	0.9673	2.0068	0.9915	0.9608	1.2481
0.9961	1.0816	2.2436	0.9894	1.0743	1.3955
0.9951	1.1256	2.3532	0.9883	1.1180	1.4636
0.9897	1.3670	2.8380	0.9830	1.3578	1.7651
QSTD	m=	2.11142	QA	m=	1.32213
	b=	-0.03845		b=	-0.02391
	r=	0.99983		r=	0.99983

Calculations

Vstd=	$\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$	Va=	$\Delta Vol((Pa-\Delta P)/Pa)$
Qstd=	$Vstd/\Delta Time$	Qa=	$Va/\Delta Time$
For subsequent flow rate calculations:			
Qstd=	$1/m \left(\left(\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)} \right) - b \right)$	Qa=	$1/m \left(\left(\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)} \right) - b \right)$

Standard Conditions

Tstd: 298.15 °K

Pstd: 760 mm Hg

Key

ΔH: calibrator manometer reading (in H2O)

ΔP: rootsmeter manometer reading (mm Hg)

Ta: actual absolute temperature (°K)

Pa: actual barometric pressure (mm Hg)

b: intercept

m: slope

RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30



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CERTIFICATE OF CALIBRATION

Ka Shing Facility Management Ltd. Flat C, 14/F, Jing Ho Industrial Building, 78-84 Wang Lung Street, Tsuen Wan, N.T.	Test Report No.	250603MCA-1P
	Date of Issue	3-Jun-25
	Date of Testing	2-Jun-25
	Page	1 of 1

Item for Calibration

Description : Laser Dust Monitor
Manufacturer : Met One Instruments, Inc.
Model No. : AEROCET-831
Serial No. : F12258

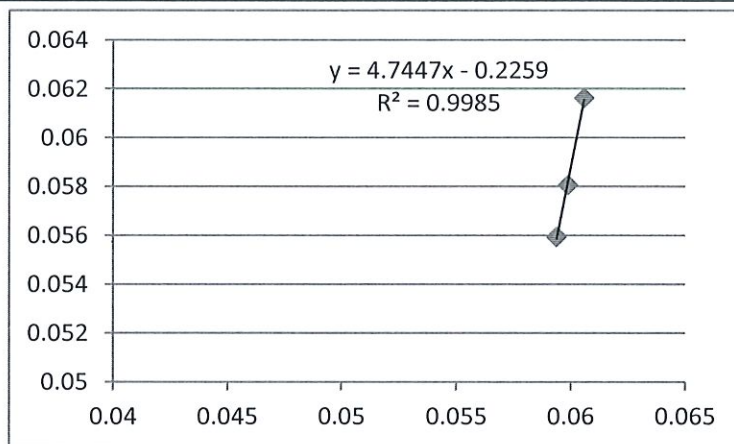
Standard Equipment

Description : High Volume Sampler / Calibration Orifice
Manufacturer : Tisch Environmental, Inc.
Model No. : TE-5170 / TE-5025A
Serial No. : 3476 / 4088
Last Calibration : 24-AUG-24 / 15-OCT-24

Date	Time	Mean Temp (°C)	Mean Pressure (hPa)	Concentration Standard Equipment (mg/m3)	Concentration Calibrated Equipment (mg/m3)
2-Jun-25	19:00	24.8	1002.2	0.0606	0.0616
2-Jun-25	20:05	24.8	1002.2	0.0594	0.0560
2-Jun-25	21:10	24.8	1002.2	0.0599	0.0581

By Linear Regression of Y or X

Slope : 4.7447
Correlation Coefficient : 0.9985
K-Factor : 1.0253
Validity of Calibration : 1-Jun-26



Recorded by : Jessica Liu

Signature:

Date: 2-Jun-25

Checked by : S Tang

Signature:

Date: 2-Jun-25



Met One
Instruments

1600 Washington Blvd
Grants Pass, OR 97526
(541) 471-7111
(541) 471-7116 (Fax)
Service@metone.com

Calibration Certificate

The calibration results on this report certify that this instrument complies with the product specifications at the time of calibration. Calibration was performed according to accepted industry methods using equipment, procedures, and standards that are traceable to NIST and ISO.

Recommended calibration interval is 12 months from the first day of use.

Instrument Model# Aerocet 831

Instrument Serial# F12258

Date of Calibration 3/31/2025

Sensor # 8894

C HEAP AT28

Dennis Chuske

Calibration Technician

Quality Check

Temperature N/A °C

Relative Humidity N/A %

Standard 24.4 °C

Standard 30.0 %

Test Procedure: Aerocet 831-6100

PSL Size (µm)	Test Results	Test Spec.	Lot# NIST	Expiration
0.3	Pass	± 10%	257546	08/31/2025
0.5	Pass	± 10%	263540	02/28/2026
1.0	Pass	± 10%	258865	09/30/2025
2.5	Pass	± 10%	258621	09/30/2025
4.0	Pass	± 10%	REF	NA
7.0	Pass	± 10%	REF	NA
10.0	Pass	± 10%	270159	07/31/2026

Standards	Model	SN	Cal Due
Particle Counter	GT-526S	X17421	7/22/2025
FLOWMETER	4040	40401945009	5/7/2025
RH/Temp Sensor	083E-1-35	R17149	11/5/2025

This calibration certificate shall not be reproduced except in full, without the written approval of Met One Instruments Inc.

FAQ / Information

Mutual Recognition Arrangements (MRA) / Multilateral Recognition Arrangements (MLA)

Mutual Recognition Arrangement (MRA) Partners for HOKLAS ^

Every effort is made to promote acceptance of test data from accredited laboratories, both internationally and locally. HKAS has concluded mutual recognition arrangements with accreditation bodies listed below by being one of the signatories of the [International Laboratory Accreditation Cooperation Mutual Recognition Arrangement \(ILAC MRA\)](#) and the [Asia Pacific Accreditation Cooperation Mutual Recognition Arrangement \(APAC MRA\)](#) for testing, calibration, medical testing, Proficiency Testing Providers (PTP) and Reference Material Producers (RMP). Click [here](#) to view the up-to-date signatories of ILAC and [here](#) to access the up-to-date signatories of APAC.

Visitors checking the names, logos and accreditation symbols shown on an endorsed certificate or report should note that some of our MRA partners may have their names, logos or accreditation symbols changed recently and test reports or certificates endorsed by displaying their old accreditation symbols may still be valid during the change-over period. For details, please visit their websites or contact them directly.

» [Mutual Recognition Arrangement \(MRA\) Partners for HOKLAS](#)

HKAS MRA partners will recognise HOKLAS endorsed test certificates as having the same technical validity as certificates endorsed by their respective schemes.

Multilateral Recognition Arrangements (MLA) for HKCAS v

Mutual Recognition Arrangement (MRA) Partners for HKIAS v

 back

Hong Kong Laboratory Accreditation Scheme (HOKLAS) - Mutual Recognition Arrangement (MRA) Partners

Economy	Logo	Name of Partner	URL	Test Area
United Kingdom of Great Britain and Northern Ireland		United Kingdom Accreditation Service (UKAS)	http://www.ukas.com	Calibration, Medical Testing, Non-medical Testing, Proficiency Testing Provider, Reference Material Producer
United States of America		AIHA Laboratory Accreditation Programs, LLC (AIHA-LAP, LLC)	http://www.aihaaccreditedlabs.org/	Non-medical Testing
United States of America		American Association for Laboratory Accreditation (A2LA)	http://www.a2la.org	Calibration, Medical Testing, Non-medical Testing, Proficiency Testing Provider, Reference Material Producer
United States of America		ANSI National Accreditation Board (ANAB)	http://www.anab.org/	Calibration, Medical Testing, Non-medical Testing, Proficiency Testing Provider, Reference Material Producer
United States of America		International Accreditation Service Inc. (IAS)	http://www.iasonline.org/	Calibration, Medical Testing, Non-medical Testing
United States of America		National Accreditation Center LLC (NAC)		Calibration, Non-medical Testing
United States of America		National Voluntary Laboratory Accreditation Program (NVLAP)	http://www.nist.gov/nvlap	Calibration, Non-medical Testing



INTERNATIONAL
ACCREDITATION
SERVICE®

CERTIFICATE OF ACCREDITATION

This is to attest that

AQUALITY TESTCONSULT LIMITED

11A&B, KAI FONG GARDEN, PING CHE ROAD
FANLING, HONG KONG

Calibration Laboratory CL-207

has met the requirements of AC204, *IAS Accreditation Criteria for Calibration Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories*. This organization is accredited to provide the services specified in the scope of accreditation.

Effective Date February 19, 2024



A handwritten signature in black ink, reading 'Raj Nathan'.

President

Visit www.iasonline.org for current accreditation information.

SCOPE OF ACCREDITATION

International Accreditation Service, Inc.

3060 Saturn Street, Suite 100, Brea, California 92821, U.S.A. | www.iasonline.org

MEASURED QUANTITY or DEVICE TYPE CALIBRATED	RANGE	UNCERTAINTY ^{1,2} (±)	CALIBRATION PROCEDURE AND/OR STANDARD EQUIPMENT USED
			dimensional requirements as specified in BS 1881- Part 105: 1984)
Test Sieve ³	4 mm to 50 mm	50 µm	Reference Caliper by direct measurement as per BS 410 : 1986
Elongation Gauge ³	Gap between Pins of Gauge 10 mm to 100 mm	0.29 mm	Reference Caliper by direct measurement (Verification in accordance with in-house method for the dimensional requirements as specified in BS 812- Part 1:1975; BS 812- Part 105.2: 1990)
Flakiness Gauge ³	Length of Slot of Gauge 4.9 mm to 33.9 mm	0.06 mm	Reference Caliper by direct measurement ((Verification in accordance with in-house method for the dimensional requirements as specified in BS 812- Part 1:1975; BS 812- Part105.1:1985; BS 812- Part105.1:1989)
Riffle Box ³	Width 6 mm to 100 mm	0.06 mm	Reference Caliper by direct measurement (Verification in accordance with in-house method for the dimensional requirements as specified in BS 812- Part 1:1975)
Mechanical			
Force Measuring Machine ³ (Compression Mode)	1 kN to 3000 kN	0.4 %	Reference Load cell by direct measurement (Based on BS 1610: Part 1:1985; BS 1610: Part 1:1992; BS EN ISO 12390-4:2000 Annex B; BS EN 12390-4: 2019; BS EN ISO 7500-1:2004, BS EN ISO 7500-1: 2015, BS EN ISO 7500-1: 2018)
Laser Dust Meter ³	Dust particles 0.1 mg/m ³ to 3 mg/m ³ 3 mg/m ³ to 8 mg/m ³	0.006 mg/m ³ 0.39 mg/m ³	By comparison method by using reference laser dust meter (Based on ISO 12103-1:2016)
Rebound Hammer ³	80 unit (hardness)	1.6 rebound count	Reference Rebound count by comparison method (Based on BS1881: Part 202:1986; BS EN 12504-2:2001; BS EN

Certificate of Calibration

Certificate No. ATS25-008-CC001

Customer: **Ka Shing Facilities Management Limited**

Flat C, 14/F., Jing Ho Industrial Building,
78-84 Wing Lung Street, Tsuen Wan,
N.T., Hong Kong

Unit-under-test (UUT):

Description: Sound Analyzer , Microphone , Pre-amplifier

Manufacturer: Rion

Type No.: NL-53 , UC-59 , NH-25

Serial No.: 01130782 , 24906 , 33673

Conditions during calibration:

Temperature: 23°C

Relative Humidity: 65%

Test Specifications: Calibration Check

Date of Calibration: 23 January 2025

Test Results: All calibration points are within manufacturer's specification.

Certified by:



Mr. Ching Mau LAM / Quality Manager
MIOA, MHKIOA



Issue Date: 24 January 2025

1. The instrument under test was allowed to stabilize in the laboratory for over 24 hours.

2. Calibration equipment:

Description: Sound Calibrator
Manufacturer & Type: Brüel & Kjær 4231
Serial No.: 2478237
Last Calibration Date: 27 February 2024
Certificate No.: AV240026

The calibration equipment used for calibration is traceable to National Standards via Standards and Calibration Laboratory, the Government of the HKSAR.

3. The Sound Analyzer has been calibrated in accordance with the requirements as specified in IEC 61672-1 Class 1, and vendor specific procedures.

4. The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted, if any, 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. Acoustic Testing Services Limited shall not be liable for any loss or damage resulting from the use of the equipment.

5. Calibration Results

Setting of unit-under-test (UUT)				Applied value		UUT Reading, dB	IEC 61672-1 Class 1 Tolerance Limits, dB	Conclusion
Range, dB	Parameter	Frequency Weighting	Response	Level, dB	Frequency, Hz			
30-130	SPL	A	F	94.00	1000	94.0	± 0.7	PASS
			S			94.0	± 0.7	PASS
			I			94.0	± 0.7	PASS
		C	F			94.0	± 0.7	PASS
			S			94.0	± 0.7	PASS
			I			94.0	± 0.7	PASS
		L	F			94.0	± 0.7	PASS
			S			94.0	± 0.7	PASS
			I			94.0	± 0.7	PASS
		A	F	114.00	1000	114.0	± 0.7	PASS
			S			114.0	± 0.7	PASS
			I			114.0	± 0.7	PASS

All calibration points are within manufacturer's specification.



Certificate of Calibration

Certificate No. ATS25-008-CC002

Customer: **Ka Shing Facility Management Limited**

Flat C, 14/F., Jing Ho Industrial Building,
78-84 Wing Lung Street, Tsuen Wan,
N.T., Hong Kong

Unit-under-test (UUT):

Description: Sound Level Meter , Microphone , Pre-amplifier

Manufacturer: BSWA Technology

Type No.: BSWA 308 , 231 , MA231T

Serial No.: 610062 , 591574 , 610373

Conditions during calibration:

Temperature: 26°C

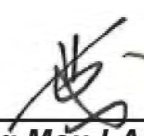
Relative Humidity: 58%

Test Specifications: Calibration Check

Date of calibration: 24 April 2025

Test Results: All calibration points are within manufacturer's specification.

Certified by:

 
Mr. Ching Mau LAM / Quality Manager
MIOA, MHKIOA

Issue Date: 24 April 2025

1. The instrument under test was allowed to stabilize in the laboratory for over 24 hours.

2. Calibration equipment:

Description:	Multifunction Acoustical Calibrator
Manufacturer & Type:	Brüel & Kjær 4226
Serial No.:	2919264
Last Calibration Date:	11 September 2024
Certificate No.:	2GB24018355-0001

The calibration equipment used for calibration is traceable to National Standards via China Ceprei Laboratory Calibration & Testing Centre. The Multifunction Acoustical Calibrator Brüel & Kjær 4226 has been accredited calibrated by other laboratory and it is found that it cannot fulfill the tolerance limits for frequency at 2000 Hz only, since the Brüel & Kjær 4226 is designed for old year version of IEC 60942 (or JJG 176), but the tolerance limits for frequency as well as sound pressure level, are updated in the most updated version of standards. However, it can still fulfill the requirements for sound pressure level from 31.5 Hz to 8000 Hz.

3. The Sound Analyzer has been calibrated in accordance with the requirements as specified in IEC 61672-1 Class 1, and vendor specific procedures.

4. The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted, if any, 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. Acoustic Testing Services Limited shall not be liable for any loss or damage resulting from the use of the equipment.

5. Calibration Results

5.1 Sound Pressure Level

Reference Sound Pressure Level

Setting of unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672-1 Class 1 Tolerance Limits, dB	Conclusion
Range, dB	Parameter	Time Weighting	Level, dB	Frequency, Hz			
22-136	dBA SPL	Fast	94.0	1000	94.0	± 0.7	PASS

Linearity

Setting of unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672-1 Class 1 Tolerance Limits, dB	Conclusion
Range, dB	Parameter	Time Weighting	Level, dB	Frequency, Hz			
22-136	dBA SPL	Fast	94.0	1000	94.0	± 0.7	PASS
			104.0		104.0	± 0.7	PASS
			114.0		114.0	± 0.7	PASS

Time Weighting

Setting of unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672-1 Class 1 Tolerance Limits, dB	Conclusion
Range, dB	Parameter	Time Weighting	Level, dB	Frequency, Hz			
22-136	dBA SPL	Fast	94.0	1000	94.0	± 0.7	PASS
		Slow			94.0	± 0.7	PASS

Frequency Response

A-weighting:

Setting of unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672-1 Class 1 Tolerance Limits, dB	Conclusion
Range, dB	Parameter	Time Weighting	Level, dB	Frequency, Hz			
22-136	SPL	Fast	54.6	31.5	54.7	± 1.5	PASS
			67.8	63	67.9	± 1.0	PASS
			77.9	125	77.9	± 1.0	PASS
			85.4	250	85.4	± 1.0	PASS
			90.8	500	90.8	± 1.0	PASS
			94.0	1000	94.0	± 0.7	PASS
			95.2	2000	95.0	± 1.0	PASS
			95.0	4000	94.1	± 1.0	PASS
			92.9	8000	90.4	+1.5; -2.5	PASS

C-weighting:

Setting of unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672-1 Class 1 Tolerance Limits, dB	Conclusion
Range, dB	Parameter	Time Weighting	Level, dB	Frequency, Hz			
22-136	SPL	Fast	91.0	31.5	91.1	± 1.5	PASS
			93.2	63	93.3	± 1.0	PASS
			93.8	125	93.9	± 1.0	PASS
			94.0	250	94.0	± 1.0	PASS
			94.0	500	94.0	± 1.0	PASS
			94.0	1000	94.0	± 0.7	PASS
			93.8	2000	93.6	± 1.0	PASS
			93.2	4000	92.4	± 1.0	PASS
			91.0	8000	88.5	+1.5; -2.5	PASS

Linear:

Setting of unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672-1 Class 1 Tolerance Limits, dB	Conclusion
Range, dB	Parameter	Time Weighting	Level, dB	Frequency, Hz			
22-136	SPL	Fast	94.0	31.5	94.2	± 1.5	PASS
				63	94.1	± 1.0	PASS
				125	94.0	± 1.0	PASS
				250	94.0	± 1.0	PASS
				500	94.0	± 1.0	PASS
				1000	94.0	± 0.7	PASS
				2000	93.8	± 1.0	PASS
				4000	93.2	± 1.0	PASS
				8000	91.8	+1.5; -2.5	PASS

All calibration points are within manufacturer's specification.



CERTIFICATE OF CALIBRATION



Class 1

京制01020122号

TYPE: BSWA 308

S/N: 630146

1. APPEARANCE Pass

2. CALIBRATION (sound)

Calibrator: BK4231 Sound Level: 93.8 dB Frequency: 1000 Hz

Microphone Model / SN: MP231 / 610759

Filter	Nominal[dB]	Indication[dB]	Error[dB]
A	93.8	93.8	0.0
C	93.8	93.8	0.0
Z	93.8	93.8	0.0

3. FREQUENCY WEIGHTINGS (sound & electrical)

Z-weighting (sound & electrical); A/C-weighting (electrical), plus Z-weighting error)

Frequency [Hz]	Attenuation[dB]		
	A	C	Z
10	-69.0	-14.3	0.0
20	-50.3	-6.2	0.0
31.5	-39.6	-3.1	0.0
63	-26.2	-0.8	0.0
125	-16.2	-0.2	0.0
250	-8.7	0.0	0.0
500	-3.3	0.0	0.0
1000	0.1	0.1	0.1
2000	1.3	-0.1	0.1
4000	0.7	-1.1	-0.2
8000	-1.1	-3.0	0.5
16000	-13.5	-15.5	-0.6
20000	-28.0	-30.0	-3.1

4. LEVEL LINEARITY (electrical)

Filter=A; Fsin=1kHz

Nominal[dB]	20	21	22	23	24	25	30	40	50	60	70	80	89
Indication[dB]	20.1	21.2	22.2	23.2	24.2	25.2	30.1	39.9	49.9	59.9	70.0	80.0	89.0
Error[dB]	0.1	0.2	0.2	0.2	0.2	0.2	0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0
Nominal[dB]	90	91	92	93	94	95	96	97	98	99	100	110	120
Indication[dB]	90.0	91.0	92.0	93.0	94.0	95.0	96.0	97.0	98.0	99.0	100.0	110.0	120.0
Error[dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nominal[dB]	129	130	131	132	133	134							
Indication[dB]	129.0	130.0	131.0	132.0	133.0	134.0							
Error[dB]	0.0	0.0	0.0	0.0	0.0	0.0							

5. SELF-GENERATED NOISE LEVEL (sound)

Measured in anechoic chamber with microphone; Backlight Off; Electrical noise please refer user manual

Filter	A	C	Z
Indication[dB]	~ 18	~ 23	~ 31

6. TIME WEIGHTINGS (electrical)

Filter=A; Fsin=4kHz; Steady Level=132dBA

Detector	F	S
Rate of Decay[dB/s]	34.7	4.4
Delta of F/S[dB]	0.0	

7. TONEBURST RESPONSE (electrical)

Filter=A; Fsin=4kHz

Steady Level L_A = 132.0 dB

Tone Burst Duration [ms]	Response[dB]		
	$L_{AFmax} - L_A$	$L_{ASmax} - L_A$	$L_{AE} - L_A$
500	-0.1	-4.1	-3.1
200	-1.0	-7.5	-7.1
50	-4.9	-13.2	-13.1
10	-11.2	-20.1	-20.1

8. REPEATED TONEBURST RESPONSE (electrical)

Filter=A; Fsin=4kHz

Steady Level L_A = 132.0 dB

Tone Burst Duration [ms]	Tone Burst Interval [ms]	Response[dB]
		$L_{Avg1} - L_A$
500	2000	-7.0
200	800	-7.1
50	200	-7.1
10	40	-7.1

9. OVERLOAD INDICATION (electrical)

Filter=A; Fsin=1000Hz

Nominal[dB]	Error[dB]			Delta of Positive and Negative[dB]
	Steady	Positive Half Cycle	Negative Half Cycle	
134.1	0.0	0.1	0.1	0.0

10. C-WEIGHTED PEAK SOUND LEVEL (electrical)

Filter=C; Peak; Fsin=500Hz

Steady Signal Level	$(L_{Cpeak} - L_C)$ [dB]		
	Single Cycle	Positive Half Cycle	Negative Half Cycle
4dB Below Top	3.5	2.3	2.3
Middle	3.6	2.3	2.3
1dB Above Floor	3.6	2.4	2.4

CONDITIONS		
Temperature	18	°C
Relative Humidity	36	%
Static Pressure	101.4	kPa

TEST EQUIPMENT				
Item	Manufacturer	Model	S/N	Description
1	B&K	4231	3008422	Sound Calibrator
2	Agilent	33220A	MY44038043	Signal Generator
3	Agilent	34401A	SG47000236	Digital Multimeter
4	NJZY	ZY5142D	0425	Step Attenuator
5	B&K	4180	2412874	Standard Microphone

TEST PROCEDURES IN ACCORDANCE WITH
IEC 61672-3:2013Class 1 Performance Verified.
Test Qualified.

DATE: 2025.05.13

TEST (sig.):

LZH

APVD (sig.):

QC
06



CERTIFICATE OF CALIBRATION



Class 1

TYPE: BSWA 308

S/N: 630178

京制01020122号

1. APPEARANCE Pass

2. CALIBRATION (sound)

Calibrator: BK4231 Sound Level: 93.8 dB Frequency: 1000 Hz

Microphone Model / SN: MP231 / 591159

Filter	Nominal[dB]	Indication[dB]	Error[dB]
A	93.8	93.8	0.0
C	93.8	93.8	0.0
Z	93.8	93.8	0.0

3. FREQUENCY WEIGHTINGS (sound & electrical)

Z-weighting (sound & electrical); A/C-weighting (electrical, plus Z-weighting error)

Frequency [Hz]	Attenuation[dB]		
	A	C	Z
10	-69.0	-14.3	0.0
20	-50.3	-6.2	0.0
31.5	-39.5	-3.1	0.0
63	-26.2	-0.8	0.0
125	-16.1	-0.2	0.0
250	-8.6	0.0	0.0
500	-3.3	0.0	0.0
1000	0.1	0.1	0.1
2000	1.4	0.0	0.2
4000	0.8	-1.0	-0.1
8000	-1.4	-3.3	0.1
16000	-12.2	-14.2	0.7
20000	-25.3	-27.3	-0.4

4. LEVEL LINEARITY (electrical)

Filter=A; Fsin=1kHz

Nominal[dB]	20	21	22	23	24	25	30	40	50	60	70	80	89
Indication[dB]	19.9	20.9	21.9	22.9	23.9	24.9	30.0	39.8	49.8	59.9	69.9	79.9	88.9
Error[dB]	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1
Nominal[dB]	90	91	92	93	94	95	96	97	98	99	100	110	120
Indication[dB]	89.9	90.9	91.9	92.9	94.0	95.0	96.0	97.0	98.0	99.0	100.0	110.0	120.0
Error[dB]	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nominal[dB]	129	130	131	132	133	134							
Indication[dB]	129.0	130.0	131.0	132.0	133.0	134.0							
Error[dB]	0.0	0.0	0.0	0.0	0.0	0.0							

5. SELF-GENERATED NOISE LEVEL (sound)

Measured in anechoic chamber with microphone; Backlight Off; Electrical noise please refer user manual

Filter	A	C	Z
Indication[dB]	~ 18	~ 23	~ 31

6. TIME WEIGHTINGS (electrical)

Filter=A; Fsin=4kHz; Steady Level=132dB

Detector	F	S
Rate of Decay[dB/s]	30.4	4.4
Delta of F/S[dB]	0.0	

7. TONEBURST RESPONSE (electrical)

Filter=A; Fsin=4kHz

Steady Level L_A = 132.0 dB

Tone Burst Duration [ms]	Response[dB]		
	$L_{AFmax} - L_A$	$L_{ASmax} - L_A$	$L_{AE} - L_A$
500	-0.1	-4.1	-3.1
200	-1.0	-7.5	-7.0
50	-4.9	-13.2	-13.1
10	-11.2	-20.1	-20.1

8. REPEATED TONEBURST RESPONSE (electrical)

Filter=A; Fsin=4kHz

Steady Level L_A = 132.0 dB

Tone Burst Duration [ms]	Tone Burst Interval [ms]	Response[dB]
		$L_{AeqT} - L_A$
500	2000	-7.0
200	800	-7.0
50	200	-7.0
10	40	-7.0

9. OVERLOAD INDICATION (electrical)

Filter=A; Fsin=1000Hz

Nominal[dB]	Steady	Error[dB]	Delta of Positive and Negative[dB]
		Positive Half Cycle	Negative Half Cycle
134.1	0.1	0.1	0.0

10. C-WEIGHTED PEAK SOUND LEVEL (electrical)

Filter=C; Peak; Fsin=500Hz

Steady Signal Level	$(L_{Cpeak} - L_C)$ [dB]		
	Single Cycle	Positive Half Cycle	Negative Half Cycle
4dB Below Top	3.6	2.3	2.3
Middle	3.5	2.3	2.3
1dB Above Floor	3.2	2.3	2.5

CONDITIONS

Temperature	23	°C
Relative Humidity	36	%
Static Pressure	100.7	kPa

TEST EQUIPMENT

Item	Manufacturer	Model	S/N	Description
1	B&K	4231	3008422	Sound Calibrator
2	Agilent	33220A	MY44038043	Signal Generator
3	Agilent	34401A	SG47000236	Digital Multimeter
4	NJZY	ZY5142D	0425	Step Attenuator
5	B&K	4180	2412874	Standard Microphone

TEST PROCEDURES IN ACCORDANCE WITH
IEC 61672-3:2013Class 1 Performance Verified.
Test Qualified.

DATE: 2025.07M01D TEST (sig.):

LZH

APVD (sig.):



BSWA308 (SN#630178)

Calibrated by manufacturer

Calibration Date: 01 July 2025

Call. Due Day: 30 June 2026



CERTIFICATE OF CALIBRATION



Class 1

TYPE: BSWA 308

S/N: 630179

京制01020122号

1. APPEARANCE Pass

2. CALIBRATION (sound)

Calibrator: BK4231 Sound Level: 93.8 dB Frequency: 1000 Hz
Microphone Model / SN: MP231 /591340

Filter	Nominal[dB]	Indication[dB]	Error[dB]
A	93.8	93.8	0.0
C	93.8	93.8	0.0
Z	93.8	93.8	0.0

3. FREQUENCY WEIGHTINGS (sound & electrical)

Z-weighting (sound & electrical); A/C-weighting (electrical, plus Z-weighting error)

Frequency [Hz]	Attenuation[dB]		
	A	C	Z
10	-69.0	-14.3	0.0
20	-50.3	-6.2	0.0
31.5	-39.5	-3.1	0.0
63	-26.2	-0.8	0.0
125	-16.1	-0.2	0.0
250	-8.6	0.0	0.0
500	-3.2	0.0	0.0
1000	0.2	0.2	0.2
2000	1.5	0.1	0.3
4000	1.1	-0.7	0.2
8000	-0.7	-2.6	0.8
16000	-12.0	-14.0	0.9
20000	-25.9	-27.9	-1.0

4. LEVEL LINEARITY (electrical)

Filter=A; Fsin=1kHz

Nominal[dB]	20	21	22	23	24	25	30	40	50	60	70	80	89
Indication[dB]	20.0	21.0	22.0	23.0	24.0	25.0	30.0	39.8	49.8	59.9	69.9	80.0	89.0
Error[dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.2	-0.1	-0.1	0.0	0.0
Nominal[dB]	90	91	92	93	94	95	96	97	98	99	100	110	120
Indication[dB]	90.0	91.0	92.0	93.0	94.0	95.0	96.0	97.0	98.0	99.0	100.0	110.0	120.0
Error[dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nominal[dB]	129	130	131	132	133	134							
Indication[dB]	129.0	130.0	131.0	132.0	133.0	134.0							
Error[dB]	0.0	0.0	0.0	0.0	0.0	0.0							

5. SELF-GENERATED NOISE LEVEL (sound)

Measured in anechoic chamber with microphone; Backlight Off; Electrical noise please refer user manual

Filter	A	C	Z
Indication[dB]	~ 18	~ 23	~ 31

6. TIME WEIGHTINGS (electrical)

Filter=A; Fsin=4kHz; Steady Level=132dB

Detector	F	S
Rate of Decay[dB/s]	32.2	4.4
Delta of F/S[dB]	0.0	

7. TONEBURST RESPONSE (electrical)

Filter=A; Fsin=4kHz

Steady Level L_A = 132.0 dB

Tone Burst Duration [ms]	Response[dB]		
	$L_{AFmax}-L_A$	$L_{ASmax}-L_A$	$L_{AE}-L_A$
500	-0.1	-4.1	-3.1
200	-1.0	-7.5	-7.0
50	-4.9	-13.2	-13.1
10	-11.2	-20.1	-20.1

8. REPEATED TONEBURST RESPONSE (electrical)

Filter=A; Fsin=4kHz

Steady Level L_A = 132.0 dB

Tone Burst Duration [ms]	Tone Burst Interval [ms]	Response[dB]
		$L_{AeqT}-L_A$
500	2000	-7.0
200	800	-7.0
50	200	-7.0
10	40	-7.0

9. OVERLOAD INDICATION (electrical)

Filter=A; Fsin=1000Hz

Nominal[dB]	Error[dB]			Delta of Positive and Negative[dB]
	Steady	Positive Half Cycle	Negative Half Cycle	
134.1	0.1	0.1	0.1	0.0

10. C-WEIGHTED PEAK SOUND LEVEL (electrical)

Filter=C; Peak; Fsin=500Hz

Steady Signal Level	$(L_{Cpeak}-L_C)$ [dB]		
	Single Cycle	Positive Half Cycle	Negative Half Cycle
4dB Below Top	3.6	2.3	2.3
Middle	3.5	2.3	2.3
1dB Above Floor	3.9	2.3	2.3

CONDITIONS

Temperature	23	°C
Relative Humidity	36	%
Static Pressure	100.7	kPa

TEST EQUIPMENT

Item	Manufacturer	Model	S/N	Description
1	B&K	4231	3008422	Sound Calibrator
2	Agilent	33220A	MY44038043	Signal Generator
3	Agilent	34401A	SG47000236	Digital Multimeter
4	NJZY	ZY5142D	0425	Step Attenuator
5	B&K	4180	2412874	Standard Microphone

TEST PROCEDURES IN ACCORDANCE WITH
IEC 61672-3:2013Class 1 Performance Verified.
Test Qualified.

DATE: 2025.07.01 TEST (sig.): LZH APVD (sig.):

BSWA308 (SN#630179)

Calibrated by manufacturer

Calibration Date: 01 July 2025

Cal. Due Day: 30 June 2026



CERTIFICATE OF CALIBRATION



Class 1

TYPE: BSWA 308

S/N: 630177

京制01020122号

1. APPEARANCE Pass

2. CALIBRATION (sound)

Calibrator: BK4231 Sound Level: 93.8 dB Frequency: 1000 Hz

Microphone Model / SN: MP231/591089

Filter	Nominal[dB]	Indication[dB]	Error[dB]
A	93.8	93.8	0.0
C	93.8	93.8	0.0
Z	93.8	93.8	0.0

3. FREQUENCY WEIGHTINGS (sound & electrical)

Z-weighting (sound & electrical); A/C-weighting (electrical, plus Z-weighting error)

Frequency [Hz]	Attenuation[dB]		
	A	C	Z
10	-69.0	-14.3	0.0
20	-50.4	-6.2	0.0
31.5	-39.5	-3.0	0.0
63	-26.2	-0.9	0.0
125	-16.1	-0.2	0.0
250	-8.6	0.0	0.0
500	-3.2	0.0	0.0
1000	0.1	0.1	0.1
2000	1.3	-0.1	0.1
4000	0.5	-1.3	-0.4
8000	-1.6	-3.5	-0.1
16000	-13.2	-15.1	-0.2
20000	-27.2	-29.1	-2.2

4. LEVEL LINEARITY (electrical)

Filter=A; Fsin=1kHz

Nominal[dB]	20	21	22	23	24	25	30	40	50	60	70	80	89
Indication[dB]	20.2	21.2	22.2	23.1	24.2	25.1	30.0	39.9	49.8	59.8	69.9	79.9	88.9
Error[dB]	0.2	0.2	0.2	0.1	0.2	0.1	0.0	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1
Nominal[dB]	90	91	92	93	94	95	96	97	98	99	100	110	120
Indication[dB]	89.9	90.9	91.9	92.9	94.0	95.0	96.0	96.9	97.9	98.9	100.0	110.0	120.0
Error[dB]	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0
Nominal[dB]	129	130	131	132	133	134							
Indication[dB]	129.0	130.0	131.0	132.0	133.0	134.0							
Error[dB]	0.0	0.0	0.0	0.0	0.0	0.0							

5. SELF-GENERATED NOISE LEVEL (sound)

Measured in anechoic chamber with microphone; Backlight Off; Electrical noise please refer user manual

Filter	A	C	Z
Indication[dB]	~ 18	~ 23	~ 31

6. TIME WEIGHTINGS (electrical)

Filter=A; Fsin=4kHz; Steady Level=132dBA

Detector	F	S
Rate of Decay[dB/s]	32.3	4.4
Delta of F/S[dB]	0.0	

7. TONEBURST RESPONSE (electrical)

Filter=A; Fsin=4kHz

Steady Level L_A = 132.0 dB

Tone Burst Duration [ms]	Response[dB]		
	$L_{AFmax}-L_A$	$L_{ASmax}-L_A$	$L_{AE}-L_A$
500	-0.2	-4.1	-3.1
200	-1.1	-7.5	-7.0
50	-4.9	-13.2	-13.1
10	-11.3	-20.1	-20.1

8. REPEATED TONEBURST RESPONSE (electrical)

Filter=A; Fsin=4kHz

Steady Level L_A = 132.0 dB

Tone Burst Duration [ms]	Tone Burst Interval [ms]	Response[dB]
		$L_{AvgT}-L_A$
500	2000	-7.1
200	800	-7.1
50	200	-7.1
10	40	-7.1

9. OVERLOAD INDICATION (electrical)

Filter=A; Fsin=1000Hz

Nominal[dB]	Error[dB]			Delta of Positive and Negative[dB]
	Steady	Positive Half Cycle	Negative Half Cycle	
134.1	0.0	0.1	0.1	0.0

10. C-WEIGHTED PEAK SOUND LEVEL (electrical)

Filter=C; Peak; Fsin=500Hz

Steady Signal Level	$(L_{Cpeak}-L_C)$ [dB]		
	Single Cycle	Positive Half Cycle	Negative Half Cycle
4dB Below Top	3.5	2.3	2.3
Middle	3.5	2.2	2.2
1dB Above Floor	3.7	2.2	2.6

CONDITIONS

Temperature	23	°C
Relative Humidity	36	%
Static Pressure	100.7	kPa

TEST EQUIPMENT

Item	Manufacturer	Model	S/N	Description
1	B&K	4231	3008422	Sound Calibrator
2	Agilent	33220A	MY44038043	Signal Generator
3	Agilent	34401A	SG47000236	Digital Multimeter
4	NJZY	ZY5142D	0425	Step Attenuator
5	B&K	4180	2412874	Standard Microphone

TEST PROCEDURES IN ACCORDANCE WITH
IEC 61672-3:2013Class 1 Performance Verified.
Test Qualified.

DATE: 2025.07.01 D TEST (sig.): LZH APVD (sig.):

BSWA 308 (SN#630177)
Calibration by manufacturer

Calibration Date: 01 July 2025

Cal. Due Day: 30 June 2026

Certificate of Calibration

Certificate No. ATS24-112-CC001

Customer: **Ka Shing Facilities Management Limited**
Flat C, 14/F., Jing Ho Industrial Building,
78-84 Wing Lung Street, Tsuen Wan,
N.T., Hong Kong

Unit-under-test (UUT):

Description: Sound Calibrator
Manufacturer: SoundTEK
Type No.: ST-120
Serial No.: 210102628

Conditions during calibration:

Temperature: 25°C
Relative Humidity: 50%

Test Specifications: Calibration Check

Date of Calibration: 11 November 2024

Test Results: All calibration points are within manufacturer's specification.

Certified by:


Mr. Ching Mau LAM / Quality Manager
MIOA, MHKIOA



Issue Date: 11 November 2024

1. The instrument under test was allowed to stabilize in the laboratory for over 24 hours.

2. Calibration equipment:

Description:	Sound Analyzer	Reference Microphone
Manufacturer:	Brüel & Kjær	Brüel & Kjær
Type No.:	2270	4189
Serial No.:	3001883	2662797
Last Calibration Date:	14 March 2024	14 March 2024
Certificate No.:	AV240037	AV240037

The calibration equipment used for calibration is traceable to National Standards via Standards and Calibration Laboratory, the Government of the HKSAR.

3. The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted, if any, 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. Acoustic Testing Services Limited shall not be liable for any loss or damage resulting from the use of the equipment.

4. Calibration Results

Nominal value dB	Measured value dB	IEC 60942 Class 1 Tolerance Limits dB	Conclusion	Expanded Measurement Uncertainty of Reference Microphone B&K 4189 at 1000 Hz dB
94.00	93.82	± 0.25	PASS	0.20
114.0	113.76	± 0.25	PASS	0.20

All calibration points are within manufacturer's specification.

