

Air Quality

Sibata LD-5R K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Information of Calibrated Equipment

Verification Test Date:	28-Nov-23	to	30-Nov-23	Next Verification Test Date:	27-Nov-24
Unit-under-Test- Model No.:	Sibata LD-5R				
Unit-under-Test Serial No.:	024545				
Our Report Reference No.:	RPT-23-HVS-0023				
Calibration Location:	AM2, location near the Leachate Treatment Works within the NENTX Landfill				

Standard Equipment Information

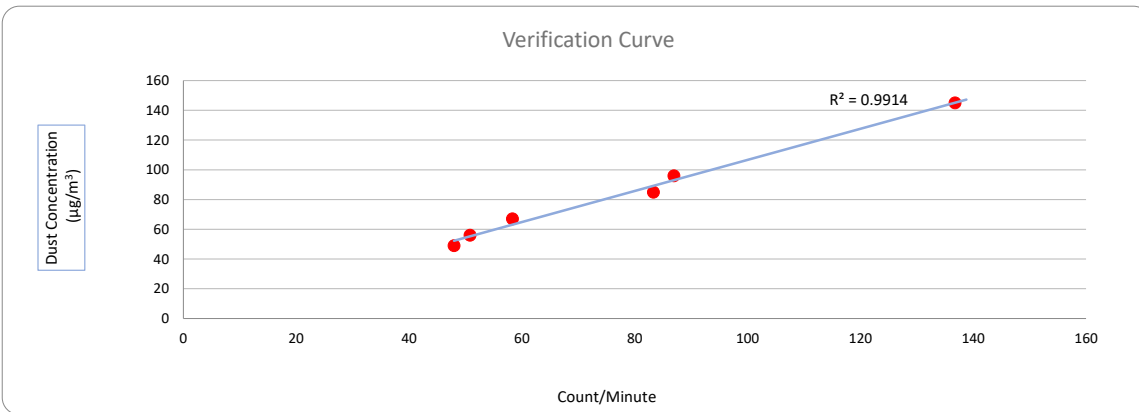
Verification Equipment Type:	Tisch TSP HVS	Tisch HVS Calibrator
Standard Equipment Model No.:	TE-5170X	TE-5028A
Equipment serial no.:	1106	3702
Last Calibration Date:	04-Nov-23	31-Mar-23
Next Calibration Date:	04-Jan-24	30-Mar-24

Equipment Verification Result

Verification Test No.	Date	Duration			Results from Calibrated Equipment		Results from Standard Equipment
		Start-time	End-time	Elapsed Time (in min)	Total Counts	Counts/ Minute x-axis	Dust Concentration ($\mu\text{g}/\text{m}^3$) y-axis
1	28/11/2023	8789.68	8792.68	180.00	15648	87	96
2	28/11/2023	8792.68	8795.68	180.00	14993	83	85
3	28/11/2023	8795.68	8798.68	180.00	8635	48	49
4	30/11/2023	8798.68	8801.68	180.00	10501	58	67
5	30/11/2023	8801.68	8804.68	180.00	24622	137	145
6	30/11/2023	8804.68	8807.68	180.00	9145	51	56

Linear Regression of y on x

Slope, K factor:	<u>1.0451</u>	Intercept:	<u>2.1545</u>	*Correlation Coefficient, R:	<u>0.9957</u>
Verification Test Result:	<u>Strong Correlation. Results were accepted.</u>			* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.	



Operated By: Andy Li
Project Technician, Environmental

Date: 02-12-2023

Checked By: Tandy Tse
Senior Consultant, Environmental

Date: 02-12-2023

Sibata LD-5R K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Information of Calibrated Equipment

Verification Test Date:	28-Nov-23	to	30-Nov-23	Next Verification Test Date:	27-Nov-24
Unit-under-Test- Model No.:	Sibata LD-5R				
Unit-under-Test Serial No.:	882106				
Our Report Reference No.:	RPT-23-HVS-0021				
Calibration Location:	AM2, location near the Leachate Treatment Works within the NENTX Landfill				

Standard Equipment Information

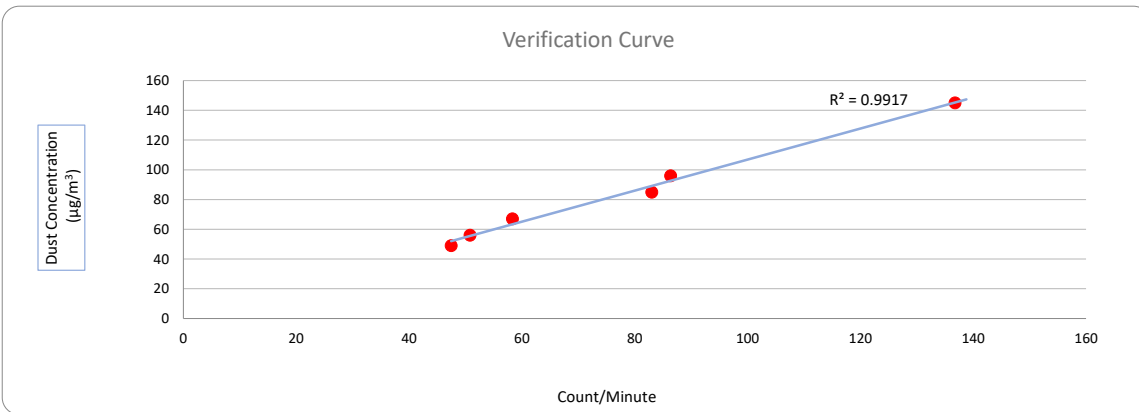
Verification Equipment Type:	Tisch TSP HVS	Tisch HVS Calibrator
Standard Equipment Model No.:	TE-5170X	TE-5028A
Equipment serial no.:	1106	3702
Last Calibration Date:	04-Nov-23	31-Mar-23
Next Calibration Date:	04-Jan-24	30-Mar-24


Equipment Verification Result

Verification Test No.	Date	Duration			Results from Calibrated Equipment		Results from Standard Equipment
		Start-time	End-time	Elapsed Time (in min)	Total Counts	Counts/ Minute x-axis	Dust Concentration ($\mu\text{g}/\text{m}^3$) y-axis
1	28/11/2023	8789.68	8792.68	180.00	15546	86	96
2	28/11/2023	8792.68	8795.68	180.00	14944	83	85
3	28/11/2023	8795.68	8798.68	180.00	8543	47	49
4	30/11/2023	8798.68	8801.68	180.00	10499	58	67
5	30/11/2023	8801.68	8804.68	180.00	24622	137	145
6	30/11/2023	8804.68	8807.68	180.00	9145	51	56


Linear Regression of y on x

Slope, K factor:	<u>1.0437</u>	Intercept:	<u>2.4993</u>	*Correlation Coefficient, R:	<u>0.9958</u>
Verification Test Result:	<u>Strong Correlation. Results were accepted.</u>			* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.	



Operated By: Andy Li 
Project Technician, Environmental

Date: 02-12-2023

Checked By: Tandy Tse 
Senior Consultant, Environmental

Date: 02-12-2023

Sibata LD-5R K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Information of Calibrated Equipment

Verification Test Date:	28-Nov-23	to	30-Nov-23	Next Verification Test Date:	27-Nov-24
Unit-under-Test- Model No.:	Sibata LD-5R				
Unit-under-Test Serial No.:	942532				
Our Report Reference No.:	RPT-23-HVS-0022				
Calibration Location:	AM2, location near the Leachate Treatment Works within the NENTX Landfill				

Standard Equipment Information

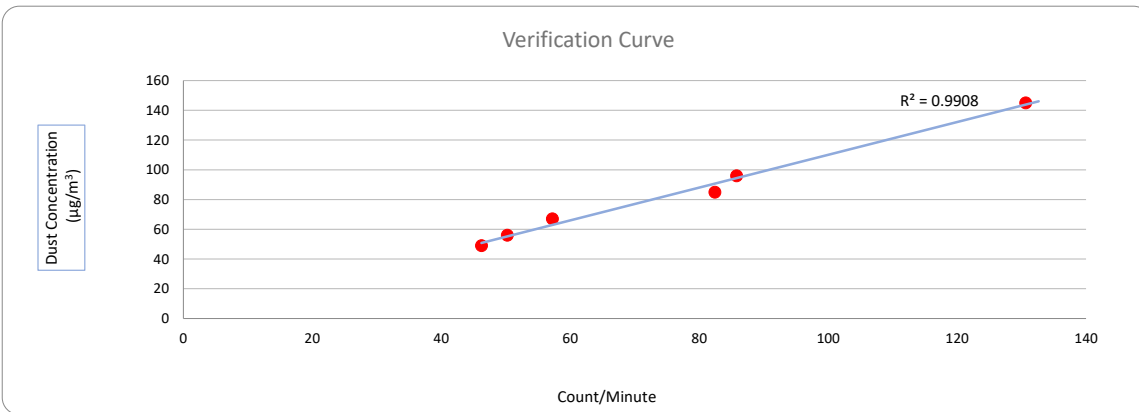
Verification Equipment Type:	Tisch TSP HVS	Tisch HVS Calibrator
Standard Equipment Model No.:	TE-5170X	TE-5028A
Equipment serial no.:	1106	3702
Last Calibration Date:	04-Nov-23	31-Mar-23
Next Calibration Date:	04-Jan-24	30-Mar-24

Equipment Verification Result

Verification Test No.	Date	Duration			Results from Calibrated Equipment		Results from Standard Equipment
		Start-time	End-time	Elapsed Time (in min)	Total Counts	Counts/ Minute x-axis	Dust Concentration ($\mu\text{g}/\text{m}^3$) y-axis
1	28/11/2023	8789.68	8792.68	180.00	15446	86	96
2	28/11/2023	8792.68	8795.68	180.00	14835	82	85
3	28/11/2023	8795.68	8798.68	180.00	8320	46	49
4	30/11/2023	8798.68	8801.68	180.00	10303	57	67
5	30/11/2023	8801.68	8804.68	180.00	23517	131	145
6	30/11/2023	8804.68	8807.68	180.00	9043	50	56

Linear Regression of y on x

Slope, K factor:	1.1020	Intercept:	-0.1223	*Correlation Coefficient, R:	0.9954
Verification Test Result:	Strong Correlation. Results were accepted.			* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.	



Operated By: Andy Li
Project Technician, Environmental

Date: 02-12-2023

Checked By: Tandy Tse
Senior Consultant, Environmental

Date: 02-12-2023

HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

Site Information

Location:	Representative For Tung Lo Hang	Site ID:	AM1	Date:	28-Feb-2024
Serial No:	1105	Model:	TE-5170X	Operator:	Andy Li

Ambient Condition

Actual Pressure during Calibration (P_a) (mm Hg):	764.2	Actual Temperature during Calibration (T_a) (deg K):	293.6
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Calibration Orifice

Model:	TE-5025A	Slope (m_c):	2.06920
Serial No.:	3465	Intercept (b_c):	-0.02547
Calibration Due Date:	15-Jan-25	Corr. Coeff:	0.99999

Calibration Data

Plate or Test #	ΔH_2O (in)	Qa, X-Axis (m ³ /min)	I, CFM (chart)	IC, Y-Axis (corrected)
18	10.00	1.556	58.0	58.59
13	7.80	1.376	54.0	54.55
10	6.00	1.208	50.0	50.51
7	4.00	0.989	44.0	44.45
5	2.60	0.800	40.0	40.41

Sampler Calibration Relationship (Qa on x-axis, IC on y-axis)

$m = \underline{\underline{24.4794}}$

 $b = \underline{\underline{20.6782}}$

 Corr. Coeff = $\underline{\underline{0.9992}}$

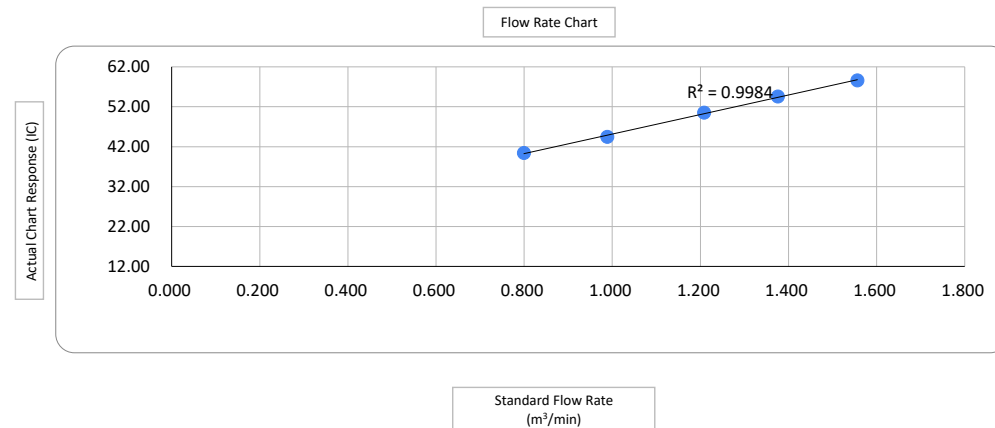
Calculations

$$Qa = 1/m_c * [\text{Sqrt}(\Delta H_2O * (P_a/P_{Std}) * (T_{Std}/T_a)) - b_c]$$

$$IC = I * (\text{Sqrt}(P_a/P_{Std}) * (T_{Std}/T_a))$$

Qa = actual flow rate
 IC = corrected chart response
 I = actual chart response
 m_c = calibrator slope
 b_c = calibrator intercept

m = sampler slope
 b = sampler intercept
 T_{Std} = 298 deg K
 P_{Std} = 760 mm Hg
 T_a = actual temperature during calibration (deg K)
 P_a = actual pressure during calibration (mm Hg)



Checked by: F.C Tsang
 Environmental Team Leader

Date: 28-Feb-2024

HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

Site Information

Location:	Representative For Heung YuenWai	Site ID:	AM2	Date:	28-Feb-2024
Serial No:	1106	Model:	TE-5170X	Operator:	Andy Li

Ambient Condition

Actual Pressure during Calibration (P_a) (mm Hg):	764.2	Actual Temperature during Calibration (T_a) (deg K):	293.6
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Calibration Orifice

Model:	TE-5025A	Slope (m_c):	2.06920
Serial No.:	3465	Intercept (b_c):	-0.02547
Calibration Due Date:	15-Jan-24	Corr. Coeff:	0.99999

Calibration Data

Plate or Test #	ΔH_2O (in)	Qa, X-Axis (m ³ /min)	I, CFM (chart)	IC, Y-Axis (corrected)
18	10.40	1.587	60.0	60.61
13	8.40	1.427	56.0	56.57
10	6.80	1.285	54.0	54.55
7	4.40	1.036	46.0	46.47
5	2.60	0.800	40.0	40.41

Sampler Calibration Relationship (Qa on x-axis, IC on y-axis)

$m =$ 25.9494

$b =$ 19.8817

Corr. Coeff= 0.9959

Calculations

$$Qa = 1/m_c * [\text{Sqrt}(\Delta H_2O * (P_a/P_{Std}) * (T_{Std}/T_a)) - b_c]$$

$$IC = I * (\text{Sqrt}(P_a/P_{Std}) * (T_{Std}/T_a))$$

Qa = actual flow rate

IC = corrected chart response

I = actual chart response

m_c = calibrator slope

b_c = calibrator intercept

m = sampler slope

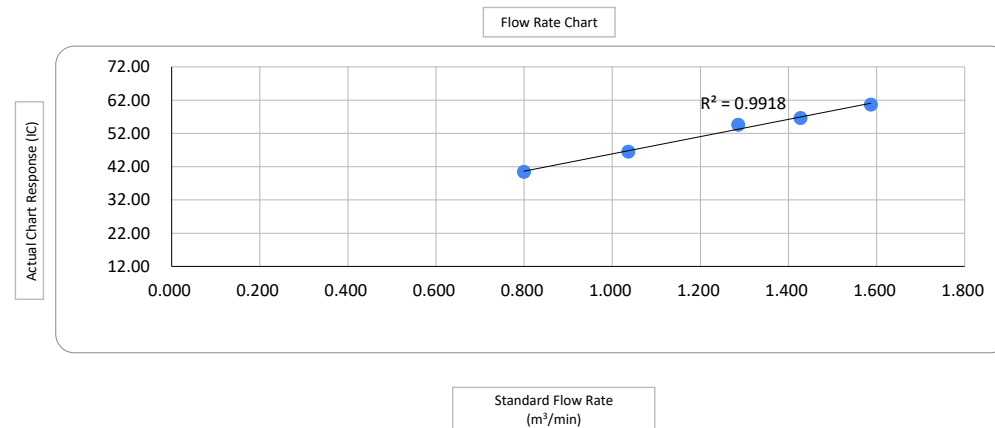
b = sampler intercept

T_{Std} = 298 deg K

P_{Std} = 760 mm Hg

T_a = actual temperature during calibration (deg K)

P_a = actual pressure during calibration (mm Hg)



Checked by: F.C Tsang
Environmental Team Leader

Date: 28-Feb-2024

HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

Site Information

Location:	Representative For Wo Keng Shan Tsuen	Site ID:	AM3	Date:	28-Feb-2024
Serial No:	1856	Model:	TE-5170X	Operator:	Andy Li

Ambient Condition

Actual Pressure during Calibration (P_a) (mm Hg):	764.2	Actual Temperature during Calibration (T_a) (deg K):	293.6
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Calibration Orifice

Model:	TE-5025A	Slope (m_c):	2.06920
Serial No.:	3465	Intercept (b_c):	-0.02547
Calibration Due Date:	15-Jan-25	Corr. Coeff:	0.99999

Calibration Data

Plate or Test #	ΔH_2O (in)	Qa, X-Axis (m ³ /min)	I, CFM (chart)	IC, Y-Axis (corrected)
18	11.20	1.646	64.0	64.66
13	8.80	1.461	60.0	60.61
10	6.40	1.247	53.0	53.54
7	4.60	1.059	46.0	46.47
5	2.80	0.829	40.0	40.41

Sampler Calibration Relationship (Qa on x-axis, IC on y-axis)

$m = \underline{\hspace{2cm} 30.7773 \hspace{2cm}}$
 $b = \underline{\hspace{2cm} 14.7102 \hspace{2cm}}$
 $\text{Corr. Coeff} = \underline{\hspace{2cm} 0.9970 \hspace{2cm}}$

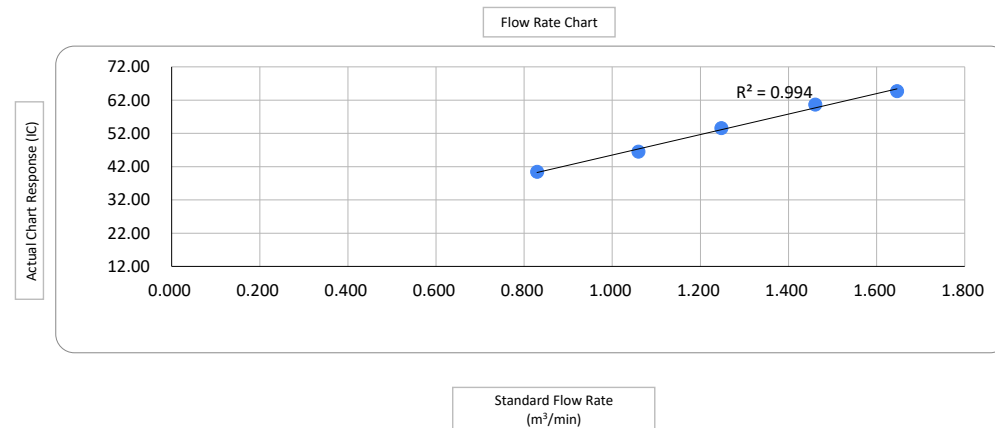
Calculations

$$Qa = 1/m_c * [\text{Sqrt}(\Delta H_2O * (P_a/P_{Std}) * (T_{Std}/T_a)) - b_c]$$

$$IC = I * (\text{Sqrt}(P_a/P_{Std}) * (T_{Std}/T_a))$$

Qa = actual flow rate
 IC = corrected chart response
 I = actual chart response
 m_c = calibrator slope
 b_c = calibrator intercept

m = sampler slope
 b = sampler intercept
 T_{Std} = 298 deg K
 P_{Std} = 760 mm Hg
 T_a = actual temperature during calibration (deg K)
 P_a = actual pressure during calibration (mm Hg)



Checked by: F.C Tsang
 Environmental Team Leader

Date: 28-Feb-2024



Certificate of Calibration

Calibration Certification Information			
Cal. Date: January 15, 2024	Rootsmeter S/N: 438320	Ta: 294	°K
Operator: Jim Tisch		Pa: 755.9	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 3465		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4350	3.3	2.00
2	3	4	1	1.0180	6.4	4.00
3	5	6	1	0.9090	8.0	5.00
4	7	8	1	0.8670	8.9	5.50
5	9	10	1	0.7150	12.9	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)	$\sqrt{\Delta H (Ta/Pa)}$ (y-axis)
1.0037	0.6995	1.4200	0.9956	0.6938	0.8820
0.9996	0.9819	2.0081	0.9915	0.9740	1.2473
0.9975	1.0973	2.2452	0.9894	1.0885	1.3945
0.9963	1.1491	2.3547	0.9882	1.1398	1.4626
0.9909	1.3859	2.8399	0.9829	1.3747	1.7639
QSTD	m=	2.06920	QA	m=	1.29570
	b=	-0.02547		b=	-0.01582
	r=	0.99999		r=	0.99999

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=	$1/m \left(\left(\sqrt{\Delta H (Ta/Pa)} \right) - b \right)$

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

Noise

Certificate of Calibration

for

Description: Sound Level Meter
Manufacturer: NTi Audio
Type No.: XL2 (Serial No.: A2A-13661-E0)
Microphone: ACO 7052 (Serial No.:84464)
Preamplifier: NTi Audio MA220 (M2211) (Serial No.:5287)

Submitted by:

Customer: Acuity Sustainability Consulting Limited
Address: Unit E, 12/F, Ford Glory Plaza,
Nos. 37-39 Wing Hong Street,
Cheung Sha Wan, Kowloon, 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: 31 August 2023

Date of calibration: 04 September 2023

Date of NEXT calibration: 03 September 2024

Calibrated by: _____
Calibration Technician

Certified by: _____
Mr. Ng Yan Wa
Laboratory Manager

Date of issue: 04 September 2023

Certificate No.: APJ23-053-CC002



Page 1 of 4

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: 23.6 °C
 Air Pressure: 1006 hPa
 Relative Humidity: 62.6 %

3. Calibration Equipment:

	Type	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV220061	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

Frequency Response

Linear Response

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	dB	SPL	94	31.5	94.1	±2.0
				63	94.1	±1.5
				125	94.1	±1.5
				250	94.1	±1.4
				500	94.1	±1.4
				1000	94.0	Ref
				2000	93.9	±1.6
				4000	93.9	±1.6
			8000	94.7	+2.1; -3.1	

A-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	94	31.5	54.7	-39.4±2.0
				63	68.2	-26.2±1.5
				125	78.0	-16.1±1.5
				250	85.5	-8.6±1.4
				500	90.8	-3.2±1.4
				1000	94.0	Ref
				2000	95.1	+1.2±1.6
				4000	94.9	+1.0±1.6
			8000	93.5	-1.1±2.1; -3.1	

C-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	dBC	SPL	94	31.5	91.2	-3.0±2.0
				63	93.5	-0.8±1.5
				125	94.0	-0.2±1.5
				250	94.1	-0.0±1.4
				500	94.1	-0.0±1.4
				1000	94.0	Ref
				2000	93.7	-0.2±1.6
				4000	93.2	-0.8±1.6
			8000	91.6	-3.0±2.1; -3.1	



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	± 0.05
	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.



Certificate of Calibration

for

Description: *Sound Level Calibrator*
Manufacturer: *RION*
Type No.: *NC-75*
Serial No.: *34724245*

Submitted by:

Customer: *Acuity Sustainability Consulting Limited*
Address: *Unit E, 12/F, Ford Glory Plaza,
Nos. 37-39 Wing Hong Street,
Cheung Sha Wan, Kowloon,
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: 27 July 2023

Date of calibration: 3 August 2023

Date of NEXT calibration: 2 August 2024

Calibrated by: _____
Calibration Technician

Certified by: _____
Mr. Ng Yan Wa
Laboratory Manager

Date of issue: 3 August 2023

Certificate No.: APJ23-049-CC003



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: 22.6°C
Air Pressure: 1006 hPa
Relative Humidity: 52.9 %

4. Calibration Equipment:

Test Equipment	Type	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV220061	HOKLAS
Sound Level Meter	RION NA-28	30721812	AV220120	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	94.0

Note:

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



AI

Calibration Certificate

Certificate No. **300737**

Page 1 of 2 Pages

Customer : Acuity Sustainability Consulting Limited

Address : Unit E, 12/F, Ford Glory Plaza, No. 37-39 Wing Hong Street, Cheung Sha Wan, Kowloon, H.K.

Order No. : Q30320

Date of receipt : 2-Feb-23

Item Tested

Description : Hot Wire Anemometer

Manufacturer : RS PRO

I.D. : ASCL-EQ-111

Model : RS-90

Serial No. : 210722208

Test Conditions

Date of Test : 13-Feb-23

Supply Voltage : --

Ambient Temperature : (23 ± 3)°C

Relative Humidity : (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : T03, Z04.

Test Results

All results were within the manufacturer's specification.

The results are shown in the attached page(s).

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S155	Std. Anemometer	206240	NIM-PRC
S223C	Std. Thermometer	205617	NIM-PRC

The values given in this Calibration 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 environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant. The test results apply to the above Unit-Under-Test only

Calibrated by : _____

James Yau

Approved by : _____

Steve Kwan

Date: 13-Feb-23

This Certificate is issued by:

Hong Kong Calibration Ltd.

Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.

Tel: 2425 8801 Fax: 2425 8646



Calibration Certificate

Certificate No. 300737

Page 2 of 2 Pages

Results :

1. Velocity

Applied Value (m/s)	UUT Reading (m/s)	Mfr's Spec.
0.00	0.00	± (3 % of reading + 0.3 m/s)
2.50	2.43	
5.00	5.04	
10.00	10.07	
15.00	15.65	
19.00	19.87	

2. Temperature

Applied Value (°C)	UUT Reading (°C)	Mfr's Spec.
23.12	23.0	± 2 °C

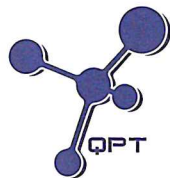
Remark : 1. UUT: Unit-Under-Test

2. Uncertainty : ± (0.9 % + 0.16 m/s) for Velocity, ± 0.1 °C for Temperature, for a confidence probability of not less than 95 %.

3. Atmospheric Pressure: 1 002 hPa

----- END -----

Water Quality



專業化驗有限公司
QUALITY PRO TEST-CONSULT LIMITED

Unit 10, 5/F, Wah Wai Centre, 38-40 Au Pui Wan St., Fotan, Hong Kong
Email: info@qualityprotest.com; Website: www.qualityprotest.com
Tel: (852) 3956 8717; Fax: (852) 3956 3928

REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Test Report No. : R-BD030061
Date of Issue : 19 March 2024
Page No. : 1 of 2

PART A - CUSTOMER INFORMATION

Acuity Sustainability Consulting Limited
Unit E, 12/F, Ford Glory Plaza 37-39 Wing Hong Street, Cheung Sha Wan, Kowloon, Hong Kong

PART B - SAMPLE INFORMATION

Name of Equipment : YSI ProDSS Multi Parameters
Manufacturer : YSI
Serial Number : 15M101091
Date of Received : 14 March 2024
Date of Calibration : 18 March 2024
Date of Next Calibration : 18 June 2024
Request No. : D-BD030061

PART C - REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

<u>Test Parameter</u>	<u>Reference Method</u>
pH value	APHA 21e 4500-H ⁺ B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure
Salinity	APHA 21e 2520 B
Dissolved oxygen	APHA 23e 4500-O G (Membrane Electrode Method)
Turbidity	APHA 21e 2130 B (Nephelometric Method)

PART D - CALIBRATION RESULT

(1) pH value

Target (pH unit)	Display Reading (pH unit)	Tolerance	Result
4.00	3.98	-0.02	Satisfactory
7.42	7.41	-0.01	Satisfactory
10.01	9.86	-0.15	Satisfactory

Tolerance of pH value should be less than ± 0.2 (pH unit)

(2) Temperature

Reading of Ref. thermometer (°C)	Display Reading (°C)	Tolerance	Result
16.0	16.5	0.5	Satisfactory
24.0	23.1	-0.9	Satisfactory
35.5	35.1	-0.4	Satisfactory

Tolerance of Temperature should be less than ± 2.0 (°C)

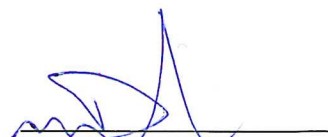
(3) Salinity

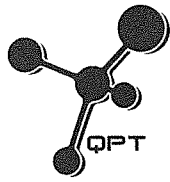
Expected Reading (g/L)	Display Reading (g/L)	Tolerance (%)	Result
10	9.38	-6.20	Satisfactory
20	18.65	-6.75	Satisfactory
30	29.05	-3.17	Satisfactory

Tolerance of Salinity should be less than ± 10.0 (%)

--- CONTINUED ON NEXT PAGE ---

AUTHORIZED
SIGNATORY:


LEE Chun-ning
Assistant Manager



專業化驗有限公司

QUALITY PRO TEST-CONSULT LIMITED

Unit 10, 5/F, Wah Wai Centre, 38-40 Au Pui Wan St., Fotan, Hong Kong

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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Test Report No. : R-BD030061
 Date of Issue : 19 March 2024
 Page No. : 2 of 2

(4) Dissolved oxygen

Expected Reading (mg/L)	Display Reading (mg/L)	Tolerance	Result
8.41	8.13	-0.28	Satisfactory
6.11	5.88	-0.23	Satisfactory
2.56	2.40	-0.16	Satisfactory
0.83	0.41	-0.42	Satisfactory

Tolerance of Dissolved oxygen should be less than ± 0.5 (mg/L)

(5) Turbidity

Expected Reading (NTU)	Display Reading (NTU)	Tolerance (%)	Result
0	0.88	--	Satisfactory
10	10.88	8.8	Satisfactory
20	21.14	5.7	Satisfactory
100	106.45	6.5	Satisfactory
800	761.97	-4.8	Satisfactory

Tolerance of Turbidity should be less than ± 10.0 (%)

Remark(s)

- The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.
- The results relate only to the calibrated equipment as received
- The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
- "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.
- The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.

--- END OF REPORT ---



Calibration Certificate

Certificate No. **400718**

Page 1 of 2 Pages

Customer : Acumen Laboratory and Testing Limited

Address : Flat / RM D, 12/F, Ford Glory Plaza, Nos. 37-39 Wing Hong Street, Cheung Shan Wan, Kowloon, Hong Kong

Order No. : Q40331

Date of receipt : 24-Jan-24

Item Tested

Description : Flow Probe

Manufacturer : Global Water

Model : FP111

I.D. : --

Serial No. : 22K100859

Test Conditions

Date of Test : 25-Jan-24

Ambient Temperature : 15°C

Supply Voltage : --

Relative Humidity : 48%

Test Specifications

Calibration check.

Ref. Document/Procedure : V12

Test Results

All results were within the manufacturer's specification.

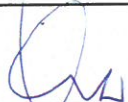
The results are shown in the attached page(s).

Main Test equipment used:

<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Traceable to</u>
S179	Std. Tape	301321	NIM-PRC
S136A	Stop Watch	303116	SCL-HKSAR

The values given in this Calibration 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 environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI), or by reference to a natural constant.
The test results apply to the above Unit-Under-Test only

Calibrated by : 
Kin Wong

Approved by : 
Steve Kwan

Date: 26-Jan-24

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

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Calibration Certificate

Certificate No. 400718

Page 2 of 2 Pages

Results :

Applied Value (m/s)	UUT Reading (m/s)	Mfr's Spec.
0.58	0.6	± 0.1 m/s

Remarks : 1. UUT : Unit-Under-Test

2. Uncertainty : ± 1 %, for a confidence probability of not less than 95%.

----- END -----

Landfill Gas

CERTIFICATION OF CALIBRATION



Date Of Calibration: 31-Aug-2023

Certificate Number: G505207_1/33483

Issued by: QED Environmental Systems Ltd.

Customer: Onuee Electronics Ltd
C3-E TCL Science Park No.1001 Zhong Shan Yuan Rd.
Nanshan Shenzhen 518052 CHINA

Description: Gas Analyser

Model: GEM5000

Serial Number: G505207

UKAS Accredited results:

Results after adjustment :

Methane (CH ₄)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	5.0	0.072
15.0	15.1	0.13
60.0	59.7	0.42

Carbon Dioxide (CO ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.8	0.074
15.0	14.5	0.13
40.0	39.9	0.29

Oxygen (O ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
20.2	20.3	0.25

The inwards assessment was carried out 21-Aug-2023.
The maximum adjustment is larger than the specification limit.
Inwards assessment data is available if requested.

All concentrations are molar.

CH₄, CO₂ readings recorded at : 33.2 °C ± 2.5 °C

O₂ readings recorded at : 24.4 °C ± 2.5 °C

Barometric Pressure : 0998 mbar ± 4 mbar

Method of Test : The analyser is calibrated in a temperature controlled chamber using a series of reference gases, in compliance with procedure LP004. .

Instrument has passed calibration as the measurement result is within the specification limit. The specification limit takes into account the measurement uncertainty.
The results relate only to the item calibrated

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:117 IGC Instance:117

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www.qedenv.com +44 (0) 333 800 0088 sales@qedenv.co.uk

QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

CERTIFICATION OF CALIBRATION



Date Of Calibration: 31-Aug-2023

Certificate Number: G505207_1/33483

Issued by: QED Environmental Systems Ltd.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrations marked 'Non-UKAS Accredited results' on this certificate have been included for completeness.

Non-UKAS accredited results after adjustment:

Barometer (mbar)	
Reference	Instrument Reading
998	999

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
CO	501	507

Date of Issue : 07-Sep-2023

Approved by Signatory

Fani Zolota

Laboratory Inspection

End of Certificate

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:117 IGC Instance:117

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