

# Air Quality

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

**Information of Calibrated Equipment**

Verification Test Date:	<u>28-Nov-23</u>	to	<u>30-Nov-23</u>	Next Verification Test Date:	<u>27-Nov-24</u>
Unit-under-Test- Model No.:	<u>Sibata LD-5R</u>				
Unit-under-Test Serial No.:	<u>0Z4545</u>				
Our Report Reference No.:	<u>RPT-23-HVS-0023</u>				
Calibration Location:	<u>AM2, location near the Leachate Treatment Works within the NENTX Landfill</u>				

**Standard Equipment Information**

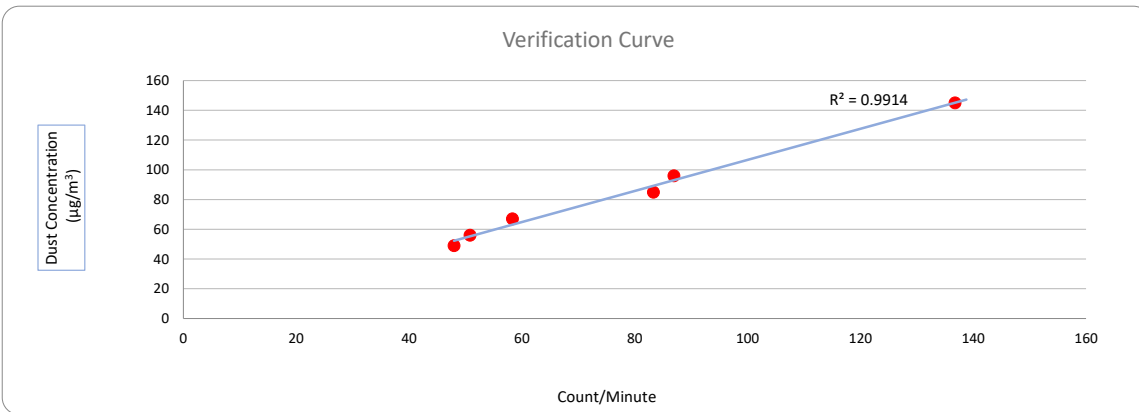
Verification Equipment Type:	<u>Tisch TSP HVS</u>	<u>Tisch HVS Calibrator</u>
Standard Equipment Model No.:	<u>TE-5170X</u>	<u>TE-5028A</u>
Equipment serial no.:	<u>1106</u>	<u>3702</u>
Last Calibration Date:	<u>04-Nov-23</u>	<u>31-Mar-23</u>
Next Calibration Date:	<u>04-Jan-24</u>	<u>30-Mar-24</u>


**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:	<b>28-Nov-23</b>	to	<b>30-Nov-23</b>	Next Verification Test Date:	<b>27-Nov-24</b>
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**

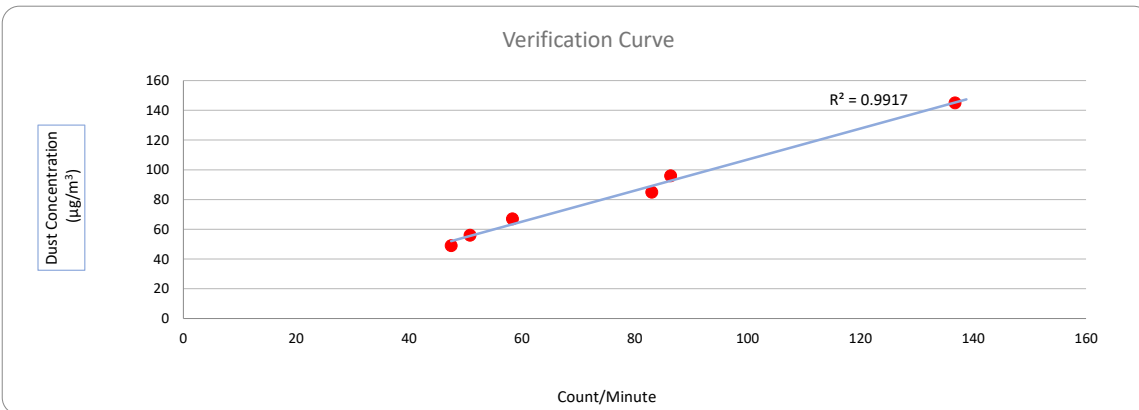
Verification Equipment Type:	Tisch TSP HVS	Tisch HVS Calibrator
Standard Equipment Model No.:	TE-5170X	TE-5028A
Equipment serial no.:	1106	3702
Last Calibration Date:	04-Nov-23	31-Mar-23
Next Calibration Date:	04-Jan-24	30-Mar-24

**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:	<b><u>1.0437</u></b>	Intercept:	<b><u>2.4993</u></b>	*Correlation Coefficient, R:	<b><u>0.9958</u></b>
Verification Test Result:	<b><u>Strong Correlation. Results were accepted.</u></b>			* 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:	<b>28-Nov-23</b>	to	<b>30-Nov-23</b>	Next Verification Test Date:	<b>27-Nov-24</b>
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**

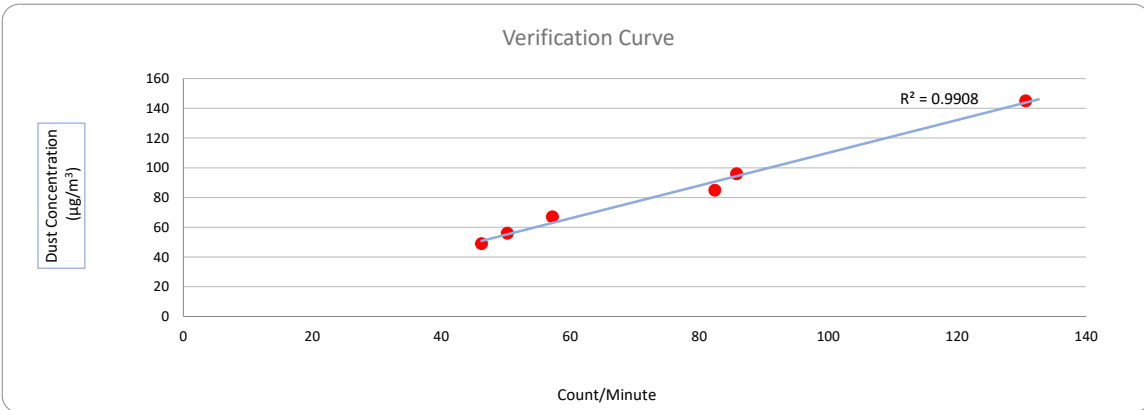
Verification Equipment Type:	Tisch TSP HVS	Tisch HVS Calibrator
Standard Equipment Model No.:	TE-5170X	TE-5028A
Equipment serial no.:	1106	3702
Last Calibration Date:	04-Nov-23	31-Mar-23
Next Calibration Date:	04-Jan-24	30-Mar-24

**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:	<b><u>1.1020</u></b>	Intercept:	<b><u>-0.1223</u></b>	*Correlation Coefficient, R:	<b><u>0.9954</u></b>
Verification Test Result:	<b><u>Strong Correlation. Results were accepted.</u></b>			* 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 Wo Keng Shan Tsuen	Site ID:	AM3	Date:	04-Jan-2024
Serial No:	1856	Model:	TE-5170X	Operator:	Andy Li

### Ambient Condition

Actual Pressure during Calibration ( $P_a$ ) (mm Hg):	757.2	Actual Temperature during Calibration ( $T_a$ ) (deg K):	234.0
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### Calibration Orifice

Model:	TE-5028A	Slope ( $m_c$ ):	1.68024
Serial No.:	3702	Intercept ( $b_c$ ):	-0.04353
Calibration Due Date:	31-Mar-24	Corr. Coeff:	0.99994

### Calibration Data

Plate or Test #	$\Delta H_2O$ (in)	Qa, X-Axis (m <sup>3</sup> /min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	8.90	2.026	60.0	67.58
2	7.00	1.800	54.0	60.83
3	6.40	1.722	50.0	56.32
4	4.80	1.495	45.0	50.69
5	3.40	1.262	40.0	45.06

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

$m = \underline{\hspace{2cm} 29.6458 \hspace{2cm}}$ 
 $b = \underline{\hspace{2cm} 6.8595 \hspace{2cm}}$ 
 $\text{Corr. Coeff} = \underline{\hspace{2cm} 0.9931 \hspace{2cm}}$

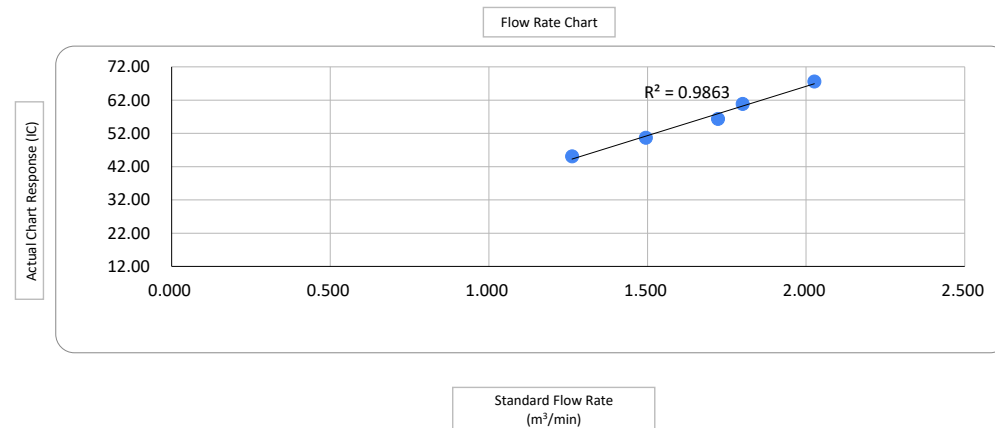
#### Calculations

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

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

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: 04-Jan-2024

## HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

### Site Information

Location:	Representative For Tung Lo Hang	Site ID:	AM1	Date:	04-Jan-2024
Serial No:	1105	Model:	TE-5170X	Operator:	Andy Li

### Ambient Condition

Actual Pressure during Calibration ( $P_a$ ) (mm Hg):	757.2	Actual Temperature during Calibration ( $T_a$ ) (deg K):	234.0
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### Calibration Orifice

Model:	TE-5028A	Slope ( $m_c$ ):	1.68024
Serial No.:	3702	Intercept ( $b_c$ ):	-0.04353
Calibration Due Date:	31-Mar-24	Corr. Coeff:	0.99994

### Calibration Data

Plate or Test #	$\Delta H_2O$ (in)	Qa, X-Axis (m <sup>3</sup> /min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	9.80	2.125	56.0	63.08
2	8.80	2.015	54.0	60.83
3	7.60	1.874	51.0	57.45
4	6.40	1.722	48.0	54.07
5	4.20	1.400	40.0	45.06

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

$m = \underline{\hspace{2cm} 24.9080 \hspace{2cm}}$ 
 $b = \underline{\hspace{2cm} 10.5891 \hspace{2cm}}$ 
 $\text{Corr. Coeff} = \underline{\hspace{2cm} 0.9982 \hspace{2cm}}$

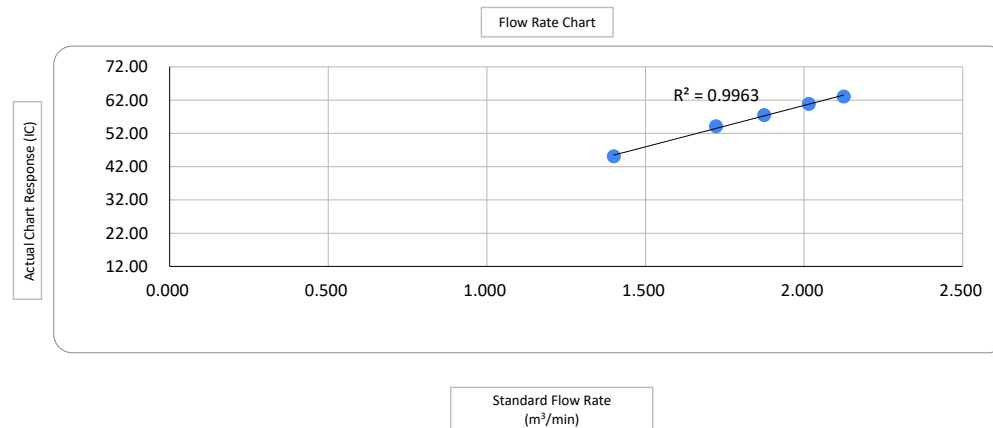
#### Calculations

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

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

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: 04-Jan-2024

## HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)

### Site Information

Location:	Representative For Heung YuenWai	Site ID:	AM2	Date:	04-Jan-2024
Serial No:	1106	Model:	TE-5170X	Operator:	Andy Li

### Ambient Condition

Actual Pressure during Calibration ( $P_a$ ) (mm Hg):	757.2	Actual Temperature during Calibration ( $T_a$ ) (deg K):	234.0
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### Calibration Orifice

Model:	TE-5028A	Slope ( $m_c$ ):	1.68024
Serial No.:	3702	Intercept ( $b_c$ ):	-0.04353
Calibration Due Date:	31-Mar-24	Corr. Coeff:	0.99994

### Calibration Data

Plate or Test #	$\Delta H_2O$ (in)	Qa, X-Axis (m <sup>3</sup> /min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	7.90	1.910	59.0	66.46
2	5.70	1.626	54.0	60.83
3	4.90	1.510	51.0	57.45
4	2.30	1.043	43.0	48.44
5	2.00	0.974	40.0	45.06

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

$m = \underline{\underline{22.1113}}$ 
   
  $b = \underline{\underline{24.4102}}$ 
   
 Corr. Coeff =  $\underline{\underline{0.9966}}$

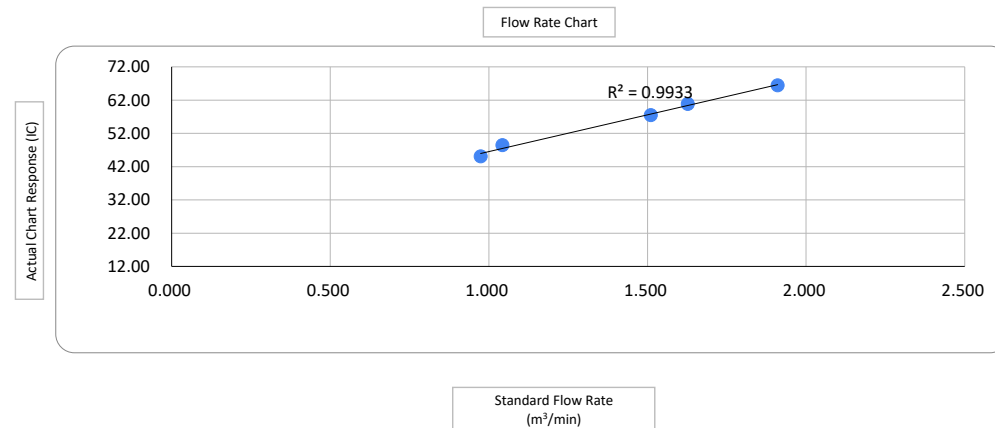
#### Calculations

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

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

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: 04-Jan-2024



# Certificate of Calibration

Calibration Certification Information			
Cal. Date: March 31, 2023	Rootsmeter S/N: 438320	Ta: 294	°K
Operator: Jim Tisch		Pa: 748.54	mm Hg
Calibration Model #: TE-5028A	Calibrator S/N: <b>3702</b>		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3110	4.1	1.50
2	3	4	1	1.0280	6.7	2.50
3	5	6	1	0.9340	8.1	3.00
4	7	8	1	0.8680	9.4	3.50
5	9	10	1	0.6580	16.2	6.00

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)
0.9929	0.7573	1.2237	0.9945	0.7586	0.7676
0.9894	0.9624	1.5798	0.9910	0.9641	0.9909
0.9875	1.0573	1.7306	0.9892	1.0591	1.0855
0.9858	1.1357	1.8693	0.9874	1.1376	1.1725
0.9767	1.4844	2.4474	0.9784	1.4869	1.5351
<b>QSTD</b>	m=	<b>1.68024</b>	<b>QA</b>	m=	<b>1.05214</b>
	b=	<b>-0.04353</b>		b=	<b>-0.02731</b>
	r=	<b>0.99994</b>		r=	<b>0.99994</b>

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.



# Noise

# Certificate of Calibration

for

**Description:** Sound Level Meter  
**Manufacturer:** NTi Audio  
**Type No.:** XL2 (Serial No.: A2A-09696-E0)  
**Microphone:** ACO 7052 (Serial No.:68914)  
**Preamplifier:** NTi Audio MA220 (Serial No.:10390)

**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 – 4kHz)  
 Outside

the allowable tolerance.

The test equipment used for calibration are traceable to National Standards via:

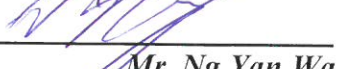
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

**Date of receipt:** 30 March 2023

**Date of calibration:** 04 April 2023

**Date of NEXT calibration:** 03 April 2024

**Calibrated by:**   
Calibration Technician

**Certified by:**   
Mr. Ng Yan Wa  
Laboratory Manager

**Date of issue:** 04 April 2023

**Certificate No.:** APJ22-164-CC002



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**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: 21.5 °C  
 Air Pressure: 1005 hPa  
 Relative Humidity: 71.4 %

**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	94.1	±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	94.1	Ref
				104		104.1	±0.3
				114		114.1	±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	94.1	Ref
			Slow			94.1	±0.3

Certificate No.: APJ22-164-CC002



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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	Fast	94	31.5	94.3	±2.0
					63	94.3	±1.5
					125	94.3	±1.5
					250	94.2	±1.4
					500	94.2	±1.4
					1000	94.1	Ref
					2000	93.8	±1.6
					4000	93.1	±1.6

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	Fast	94	31.5	55.0	-39.4±2.0
					63	68.2	-26.2±1.5
					125	78.2	-16.1±1.5
					250	85.6	-8.6±1.4
					500	91.0	-3.2±1.4
					1000	94.1	Ref
					2000	95.0	+1.2±1.6
					4000	94.1	+1.0±1.6

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	Fast	94	31.5	91.3	-3.0±2.0
					63	93.5	-0.8±1.5
					125	94.1	-0.2±1.5
					250	94.2	-0.0±1.4
					500	94.2	-0.0±1.4
					1000	94.1	Ref
					2000	93.6	-0.2±1.6
					4000	92.3	-0.8±1.6



Certificate No.: APJ22-164-CC002

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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	± 0.15
	63 Hz	± 0.10
	125 Hz	± 0.05
	250 Hz	± 0.05
	500 Hz	± 0.05
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.05
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

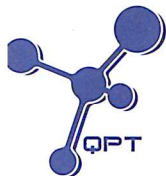
Remark : 1. UUT: Unit-Under-Test

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-BC120001  
Date of Issue : 05 December 2023  
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 : HORIBA U-53  
Manufacturer : HORIBA  
Serial Number : PPHNOMXY  
Date of Received : 30 November 2023  
Date of Calibration : 04 December 2023  
Date of Next Calibration : 03 March 2024  
Request No. : D-BC120001

### PART C - REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Test Parameter	Reference Method
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 21c 2520 B
Dissolved oxygen	APHA 23e 4500-O G (Membrane Electrode Method)
Turbidity	APHA 21c 2130 B (Nephelometric Method)

### PART D - CALIBRATION RESULT

#### (1) pH value

Target (pH unit)	Display Reading (pH unit)	Tolerance	Result
4.00	4.10	0.10	Satisfactory
7.42	7.44	0.02	Satisfactory
10.01	9.92	-0.09	Satisfactory

Tolerance of pH value should be less than  $\pm 0.2$  (pH unit)

#### (2) Temperature

Reading of Ref. thermometer (°C)	Display Reading (°C)	Tolerance	Result
36	36.77	0.77	Satisfactory
25	26.77	1.77	Satisfactory
15	16.26	1.26	Satisfactory

Tolerance of Temperature should be less than  $\pm 2.0$  (°C)

#### (3) Salinity

Expected Reading (g/L)	Display Reading (g/L)	Tolerance (%)	Result
10	10.00	0.00	Satisfactory
20	21.07	5.35	Satisfactory
30	32.30	7.67	Satisfactory

Tolerance of Salinity should be less than  $\pm 10.0$  (%)

--- CONTINUED ON NEXT PAGE ---

AUTHORIZED  
SIGNATORY:

  
LEE Chun-ning  
Assistant Manager



## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Test Report No. : R-BC120001  
Date of Issue : 05 December 2023  
Page No. : 2 of 2

### (4) Dissolved oxygen

Expected Reading ( mg/L )	Display Reading ( mg/L )	Tolerance	Result
7.99	7.66	-0.33	Satisfactory
5.00	4.68	-0.32	Satisfactory
2.58	2.21	-0.37	Satisfactory
0.10	0.07	-0.03	Satisfactory

Tolerance of Dissolved oxygen should be less than  $\pm 0.5$  ( mg/L )

### (5) Turbidity

Expected Reading ( NTU )	Display Reading ( NTU )	Tolerance ( % )	Result
0	0.62	--	Satisfactory
10	9.29	-7.1	Satisfactory
20	21.30	6.5	Satisfactory
100	105.00	5.0	Satisfactory
800	850.00	6.3	Satisfactory

Tolerance of Turbidity should be less than  $\pm 10.0$  ( % )

### Remark(s)

- The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted from 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 from relevant international standards.

--- END OF REPORT ---



# Calibration Certificate

Certificate No. **300745**

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 :** Global Flow Probe

**Manufacturer :** Global Water

**Model :** FP111

**I.D. :** --

**Serial No. :** 22K100858

## Test Conditions

**Date of Test :** 27-Mar-23

**Ambient Temperature :** 20°C

**Supply Voltage :** --

**Relative Humidity :** 75%

## 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	201878	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 :**   
Alan Chu

**Date:** 27-Mar-23



# Calibration Certificate

Certificate No. 300745

Page 2 of 2 Pages

Results :

Applied Value (m/s)	UUT Reading (m/s)	Mfr's Spec.
0.78	0.8	$\pm 0.1$ m/s

Remarks : 1. UUT : Unit-Under-Test

2. Uncertainty :  $\pm 1$  %, 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 <sub>4</sub> )		
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 <sub>2</sub> )		
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 <sub>2</sub> )		
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.

CH<sub>4</sub>, CO<sub>2</sub> readings recorded at : 33.2 °C ± 2.5 °C

O<sub>2</sub> 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](http://www.qedenv.com) +44 (0) 333 800 0088 [sales@qedenv.co.uk](mailto: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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