

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

Verification Test Date: 9-Oct-22 to 16-Oct-22
Next Verification Test Date: 15-Oct-23
Unit-under-Test- Model No. Sibata LD-5R
Unit-under-Test Serial No. 851820
Our Report Reference No. RPT-22-HVS-0019

Standard Equipment Information

Verification Equipment Type	Tisch TSP HVS	Tisch HVS Calibrator
Standard Equipment Model No.	TE-5170X	TE-5025A
Equipment serial no.	MFC 1049	3465
Last Calibration Date	28-Sep-22	28-Jun-22
Next Calibration Date	28-Nov-22	29-Jun-23

Verification Test No.	Date	Time			K-Factor	Counts/Minute (R)	Total Counts (TC)	TSP Sample ID No.	Dust Concentration (ug/m3), (C)
		Start-time	End-time	Elapsed Time (in min)	K-Factor (K=C/R)	x-axis			y axis
1	9/10/2022	6210.34	6213.34	180.00	0.00122	28.00	5040	R221670/1	34
2	9/10/2022	6213.34	6216.36	181.20	0.00103	64.00	11597	R221670/2	66
3	9/10/2022	6216.36	6221.78	325.20	0.00120	85.67	27859	R221670/3	103
4	16/10/2022	6249.91	6252.92	180.60	0.00102	53.00	9571.8	R221671/1	54
5	16/10/2022	6252.92	6255.92	180.00	0.00114	77.33	13920	R221671/2	88
6	16/10/2022	6255.92	6261.94	361.20	0.00116	71.33	25766	R221671/3	83
					0.00113				

K-Factor to be inputted in LD-5R (corrected 1 decimal point): 1.1

By Linear Regression of y on x:

slope, mh= 1.1948

intercept, ch= -4.2432

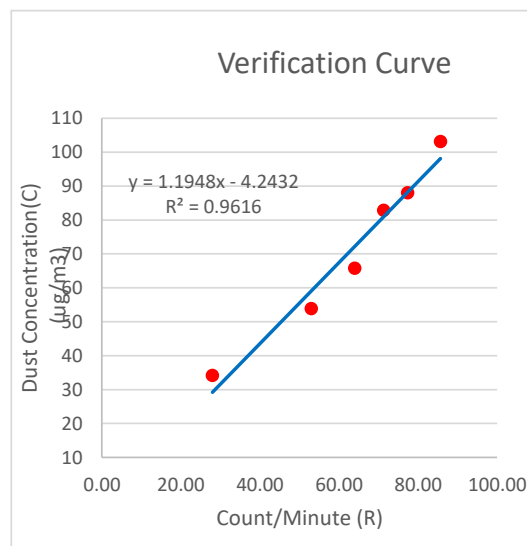
*Correlation Coefficient, R= 0.9806

Verification Test Result: Strong Correlation, Results were accepted.

* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.

Verified By: 
Field Supervisor

Date: 19-10-2022



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

Verification Test Date: 9-Oct-22 to 16-Oct-22
Next Verification Test Date: 15-Oct-23
Unit-under-Test- Model No. Sibata LD-5R
Unit-under-Test Serial No. 882109
Our Report Reference No. RPT-22-HVS-0015

Standard Equipment Information

Verification Equipment Type	Tisch TSP HVS	Tisch HVS Calibrator
Standard Equipment Model No.	TE-5170X	TE-5025A
Equipment serial no.	MFC 1049	3465
Last Calibration Date	28-Sep-22	28-Jun-22
Next Calibration Date	28-Nov-22	29-Jun-23

Verification Test No.	Date	Time			K-Factor	Counts/Minute (R)	Total Counts (TC)	TSP Sample ID No.	Dust Concentration (ug/m3), (C)
		Start-time	End-time	Elapsed Time (in min)	K-Factor (K=C/R)	x-axis			y axis
1	9/10/2022	6210.34	6213.34	180.00	0.00083	41.00	7380	R221670/1	34
2	9/10/2022	6213.34	6216.36	181.20	0.00100	65.67	11899	R221670/2	66
3	9/10/2022	6216.36	6221.78	325.20	0.00107	96.33	31328	R221670/3	103
4	16/10/2022	6249.91	6252.92	180.60	0.00104	52.00	9391.2	R221671/1	54
5	16/10/2022	6252.92	6255.92	180.00	0.00122	72.33	13020	R221671/2	88
6	16/10/2022	6255.92	6261.94	361.20	0.00113	73.00	26368	R221671/3	83
					0.00105				

K-Factor to be inputted in LD-5R (corrected 1 decimal point): 1.0

By Linear Regression of y on x:

slope, mh= 1.2732

intercept, ch= -13.6573

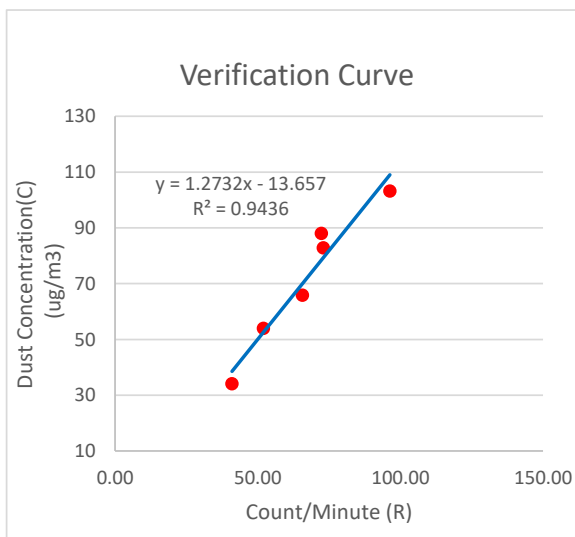
*Correlation Coefficient, R= 0.9714

Verification Test Result: Strong Correlation, Results were accepted.

* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.

Verified By: 
Field Supervisor

Date: 19-10-2022



PC-3A(E) K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Verification Test Date: 9-Oct-22 to 16-Oct-22
 Next Verification Test Date: 8-Oct-23
 Unit-under-Test- Model No. PC-3A(E)
 Unit-under-Test Serial No. JC-220710221
 Our Report Reference No. RPT-22-HVS-0033
 Calibration Location: Emax

Standard Equipment Information			
Verification Equipment Type	Tisch TSP HVS	Tisch HVS Calibrator	
Standard Equipment Model No.	TE-5170X	TE-5025A	
Equipment serial no.	MFC 1049	3465	
Last Calibration Date	28-Sep-22	28-Jun-22	
Next Calibration Date	28-Nov-22	29-Jun-23	

Verification Test No.	Date	Time			K-Factor	Counts/Minute (R)	Total Counts (TC)	TSP Sample ID No.	Dust Concentration (ug/m3), (C)
		Start-time	End-time	Elapsed Time (in min)		x-axis			y axis
1	9/10/2022	6210.34	6213.34	180.00	0.00088	39	6960	R221670/1	34
2	9/10/2022	6213.34	6216.36	181.20	0.00094	70	12624	R221670/2	66
3	9/10/2022	6216.36	6221.78	325.20	0.00094	109	35555	R221670/3	103
4	16/10/2022	6249.91	6252.92	180.60	0.00094	57	10354	R221671/1	54
5	16/10/2022	6252.92	6255.92	180.00	0.00095	92	16620	R221671/2	88
6	16/10/2022	6255.92	6261.94	361.20	0.00095	87	31545	R221671/3	83
					0.00094				

K-Factor to be inputted in PC-3A(E) (corrected 1 decimal point): 0.94

By Linear Regression of y on x:

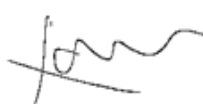
slope, mh= 0.9766

intercept, ch= -2.7104

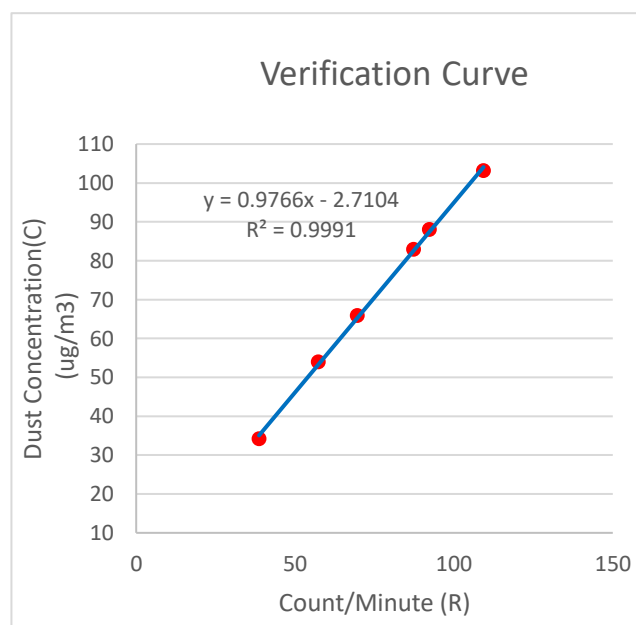
*Correlation Coefficient, R= 0.9996

Verification Test Result: Strong Correlation, Results were accepted.

* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.

Verified By: 
 Field Supervisor

Date: 19-10-2022



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

Information of Calibrated Equipment

Verification Test Date:	1-Mar-23	to	2-Mar-23	Next Verification Test Date:	1-Mar-24
Unit-under-Test- Model No.:	Sibata LD-5R				
Unit-under-Test Serial No.:	2Y6549				
Our Report Reference No.:	RPT-23-HVS-0006				
Calibration Location:	Emax				

Standard Equipment Information

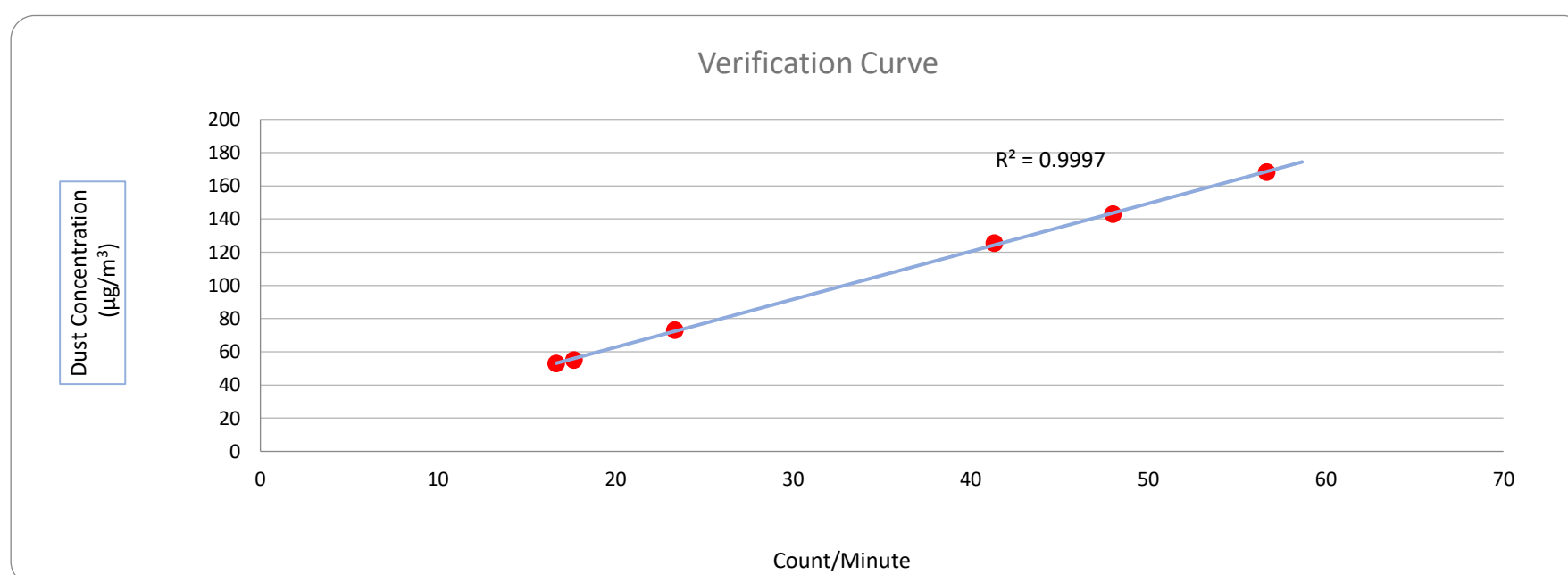
Verification Equipment Type:	Tisch TSP HVS	Tisch HVS Calibrator
Standard Equipment Model No.:	TE-5170X	TE-5025A
Equipment Serial no.:	1855	3465
Last Calibration Date:	1-Mar-23	28-Jun-22
Next Calibration Date:	30-Apr-23	27-Jun-23

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	1/3/2023	5013.27	5016.34	184.20	7614	41	125
2	1/3/2023	5016.34	5019.34	180.00	8640	48	143
3	1/3/2023	5019.34	5022.34	180.00	10200	57	168
4	2/3/2023	5022.34	5025.34	180.00	3000	17	53
5	2/3/2023	5025.34	5028.34	180.00	3180	18	55
6	2/3/2023	5028.34	5031.34	180.00	4200	23	73

Linear Regression of y on x

Slope, K factor:	<u>2.8867</u>	Intercept:	<u>4.9711</u>	*Correlation Coefficient, R:	<u>0.9999</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: 01-03-2023

Checked By: Tandy Tse
Senior Consultant, Environmental

Date: 01-03-2023

Certificate of Calibration

for

Description: *Sound Level Meter*
Manufacturer: *NTi Audio*
Type No.: *XL2 (Serial No.: A2A-13548-E0)*
Microphone: *ACO 7052 (Serial No.:73912)*
Preamplifier: *NTi Audio M2211 MA220 (Serial No.:5735)*

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: 2 February 2023

Date of calibration: 6 February 2023

Date of NEXT calibration: 5 February 2024

Calibrated by: _____
Calibration Technician

Certified by: _____
Mr. Ng Yan Wa
Laboratory Manager

Date of issue: 6 February 2023

Certificate No.: APJ22-124-CC001



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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: 23.9 °C
 Air Pressure: 1006 hPa
 Relative Humidity: 47.9 %

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

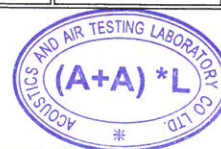
Linearity

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.: APJ22-124-CC001



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Frequency Response

Linear Response

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
30-130	dB	SPL	94	31.5	94.1	± 2.0
				63	94.2	± 1.5
				125	94.1	± 1.5
				250	94.1	± 1.4
				500	94.2	± 1.4
				1000	94.1	Ref
				2000	94.5	± 1.6
				4000	95.2	± 1.6
				8000	94.9	$+2.1; -3.1$

A-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
30-130	dBA	SPL	94	31.5	54.8	-39.4 ± 2.0
				63	68.0	-26.2 ± 1.5
				125	78.0	-16.1 ± 1.5
				250	85.5	-8.6 ± 1.4
				500	91.0	-3.2 ± 1.4
				1000	94.1	Ref
				2000	95.7	$+1.2 \pm 1.6$
				4000	96.2	$+1.0 \pm 1.6$
				8000	93.9	$-1.1 \pm 2.1; -3.1$

C-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
30-130	dBC	SPL	94	31.5	91.2	-3.0 ± 2.0
				63	93.4	-0.8 ± 1.5
				125	94.0	-0.2 ± 1.5
				250	94.1	-0.0 ± 1.4
				500	94.2	-0.0 ± 1.4
				1000	94.1	Ref
				2000	94.3	-0.2 ± 1.6
				4000	94.4	-0.8 ± 1.6
				8000	92.0	$-3.0 \pm 2.1; -3.1$

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5. Calibration Results Applied

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

Uncertainties of Applied Value:

94 dB	31.5 Hz	± 0.10
	63 Hz	± 0.10
	125 Hz	± 0.10
	250 Hz	± 0.05
	500 Hz	± 0.10
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.05
	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 No.: APJ22-124-CC001



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JCSS
JCSS 0197

CALIBRATION CERTIFICATE

Product : SOUND CALIBRATOR
Type : NC-75
Serial number : 35124529
Manufacturer : RION CO., LTD.
Calibration quantities : Sound pressure level (with reference standard microphone)
Calibration method : Measured by specified secondary standard microphone
according to JCSS calibration procedure specified by RION.
Ambient conditions : Temperature 23.9 °C, Relative humidity 49 %,
Static pressure 100.6 kPa
Calibration date : 02/11/2022 (DD/MM/YYYY)
Calibration location : 3-20-41 Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan
RION CO., LTD. Calibration Room

We hereby certify that the results of this calibration were as follows.

Issue date : 09/11/2022 (DD/MM/YYYY)

Junichi Kawamura
Manager
Quality Assurance Section,
Quality Assurance Department,
Environmental Instrument Division,
RION CO., LTD.
3-20-41 Higashimotomachi, Kokubunji,
Tokyo 185-8533, Japan



This certificate is based on article 144 of the Measurement Law and indicates the result of calibration in accordance with measurement standards traceable to Primary Measurement Standards (National Standards) which realizes the physical units of measurement according to the International System of Units (SI).

The accreditation symbol is attestation of which the result of calibration is traceable to Primary Measurement Standards (National Standards).

The certificate shall not be reproduced except in full, without the written approval of the issuing laboratory.

The calibration laboratory who issued this calibration certificate conforms to ISO/IEC 17025:2017.

This calibration certificate was issued by the calibration laboratory accredited by IA Japan who is a signatory to the Mutual Recognition Arrangement (MRA) of International Laboratory Accreditation Cooperation (ILAC) and Asia Pacific Accreditation Cooperation (APAC). This (These) calibration result(s) may be accepted internationally through ILAC/APAC MRA.

CALIBRATION RESULT

1. Sound pressure level (with reference standard microphone)

Measured value	Expanded uncertainty * ¹
93.99 dB	0.09 dB

Specified secondary standard microphone:

Type : 4160

Serial number : 2973341

Reference Sound pressure : 2×10^{-5} Pa

*¹ Defines an interval estimated to have a level of confidence of approximately 95 %.

Coverage factor $k=2$

Calibration result is the calibration value in ambient conditions during calibration.

BE OUT OF JCSS CALIBRATION

1. Frequency

Measured value	Measurement uncertainty ($k=2$)
1000.0 Hz	2.7×10^{-4} Hz

Working measurement standard universal counter:

Type : 53132A

Serial number : MY40005574

(JCSS Calibration Certificate No. 2208001889940)

2. Total distortion

Measured value
0.2 %

Working measurement standard distortion meter:

Type : VA-2230A

Serial number : 11076061

(A2LA Calibration Certificate No. 1502-03109)

- closing -