

Certificate of Calibration - Wind Monitoring Station

Description: Yau Lai Estate, Bik Lai House
 Manufacturer: Davis Instruments
 Model No.: Davis7440
 Serial No.: MC01010A44
 Equipment No.: SA-03-04
 Date of Calibration: 17-Feb-2025
 Next Due Date: 17-Aug-2025

1. Performance check of Wind Speed

Wind Speed, m/s		Difference D (m/s)
Wind Speed Reading (V1)	Anemometer Value (V2)	$D = V1 - V2$
0.0	0.0	0.0
1.5	1.4	0.1
2.5	2.4	0.1
4.0	3.8	0.2

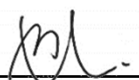
2. Performance check of Wind Direction

Wind Direction (°)		Difference D (°)
Wind Direction Reading (W1)	Marine Compass Value (W2)	$D = W1 - W2$
0	0	0.0
90	90	0.0
180	180	0.0
270	270	0.0

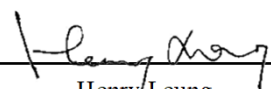
Test Specification:

1. Performance Wind Speed Test - The wind meter was on-site calibrated against the anemometer
2. Performance Wind Direction Test - The wind meter was on-site calibrated against the marine compass at four direction

Calibrated by:


 Wong Shing Kwai

Approved by:


 Henry Leung

Certificate of Calibration - Wind Monitoring Station

Description: Yau Lai Estate, Bik Lai House
Manufacturer: Davis Instruments
Model No.: Davis7440
Serial No.: MC01010A44
Equipment No.: SA-03-04
Date of Calibration 17-Aug-2025
Next Due Date 17-Feb-2026

1. Performance check of Wind Speed

Wind Speed, m/s		Difference D (m/s)
Wind Speed Reading (V1)	Anemometer Value (V2)	$D = V1 - V2$
0.0	0.0	0.0
1.5	1.5	0.0
2.5	2.4	0.1
4.0	3.9	0.1

2. Performance check of Wind Direction

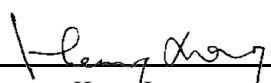
Wind Direction (°)		Difference D (°)
Wind Direction Reading (W1)	Marine Compass Value (W2)	$D = W1 - W2$
0	0	0.0
90	90	0.0
180	180	0.0
270	270	0.0

Test Specification:**1. Performance Wind Speed Test - The wind meter was on-site calibrated against the anemometer****2. Performance Wind Direction Test - The wind meter was on-site calibrated against the marine compass at four direction**

Calibrated by:


Wong Shing Kwai

Approved by:


Henry Leung



Certificate of Calibration

Calibration Certification Information

Cal. Date: January 7, 2025 Roots-meter S/N: 438320 Ta: 293 °K
Operator: Jim Tisch Pa: 759.0 mm Hg
Calibration Model #: TE-5025A Calibrator S/N: **3864**

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4590	3.2	2.00
2	3	4	1	1.0360	6.4	4.00
3	5	6	1	0.9160	8.0	5.00
4	7	8	1	0.8800	8.8	5.50
5	9	10	1	0.7270	12.7	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)
1.0114	0.6932	1.4252	0.9958	0.6825	0.8787
1.0071	0.9721	2.0156	0.9916	0.9571	1.2427
1.0050	1.0971	2.2535	0.9895	1.0802	1.3893
1.0039	1.1408	2.3635	0.9884	1.1232	1.4572
0.9987	1.3737	2.8505	0.9833	1.3525	1.7574
QSTD	m=	2.08969	QA	m=	1.30853
	b=	-0.02374		b=	-0.01464
	r=	0.99985		r=	0.99985

Calculations

Vstd=	$\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$	Va=	$\Delta Vol((Pa-\Delta P)/Pa)$
Qstd=	Vstd/ΔTime	Qa=	Va/ΔTime
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: roots-meter 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

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA20003/18/033

Project No. CKL 1 - Flat 121 Cha Kwo Ling Village

Date: 4-Jul-25 Next Due Date: 4-Sep-25 Operator: SK

Equipment No.: A-01-18 Model No.: TE 5170 Serial No. 0723

Ambient Condition			
Temperature, Ta (K)	<u>303.8</u>	Pressure, Pa (mmHg)	<u>754.1</u>

Orifice Transfer Standard Information					
Serial No.	<u>3864</u>	Slope, mc	<u>0.05914</u>	Intercept, bc	<u>-0.02377</u>
Last Calibration Date:	<u>7-Jan-25</u>	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	<u>7-Jan-26</u>	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	<u>13.2</u>	<u>3.58</u>	<u>61.01</u>	<u>8.8</u>	<u>2.93</u>
2	<u>10.4</u>	<u>3.18</u>	<u>54.20</u>	<u>7.3</u>	<u>2.67</u>
3	<u>8.3</u>	<u>2.84</u>	<u>48.46</u>	<u>5.1</u>	<u>2.23</u>
4	<u>6.2</u>	<u>2.46</u>	<u>41.94</u>	<u>3.4</u>	<u>1.82</u>
5	<u>3.3</u>	<u>1.79</u>	<u>30.71</u>	<u>1.4</u>	<u>1.17</u>

By Linear Regression of Y on X

Slope, mw = 0.0598 Intercept, bw = -0.6672

Correlation coefficient* = 0.9970

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.73

Remarks: _____

Conducted by: Wong Shing Kwai Signature: [Signature] Date: 4-Jul-25

Checked by: Henry Leung Signature: [Signature] Date: 4-Jul-25

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA20003/55/033

Project No. CKL 2 - Flat 103 Cha Kwo Ling Village

Date: 4-Jul-25 Next Due Date: 4-Sep-25 Operator: SK

Equipment No.: A-01-55 Model No.: TE 5170 Serial No. 1956

Ambient Condition			
Temperature, Ta (K)	303.8	Pressure, Pa (mmHg)	754.1

Orifice Transfer Standard Information					
Serial No.	3864	Slope, mc	0.05914	Intercept, bc	-0.02377
Last Calibration Date:	7-Jan-25	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	7-Jan-26	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	13.4	3.61	61.47	9.1	2.98
2	11.2	3.30	56.23	7.2	2.65
3	9.3	3.01	51.27	5.5	2.31
4	5.1	2.23	38.07	2.6	1.59
5	3.7	1.90	32.49	2.0	1.40

By Linear Regression of Y on X

Slope, mw = 0.0551 Intercept, bw = -0.4575

Correlation coefficient* = 0.9969

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation	
From the TSP Field Calibration Curve, take Qstd = 43 CFM	
From the Regression Equation, the "Y" value according to	
$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$	
Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ <u>3.76</u>	

Remarks: _____

Conducted by: Wong Shing Kwai Signature: [Signature] Date: 4-Jul-25

Checked by: Henry Leung Signature: [Signature] Date: 4-Jul-25

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA20003/04/0031

Project No. KER 1 - Future Residential Development at Kerry Godown

Date: 11-Jul-25 Next Due Date: 11-Sep-25 Operator: SK

Equipment No.: A-01-04 Model No.: TE 5170 Serial No. 10595

Ambient Condition			
Temperature, Ta (K)	<u>300.9</u>	Pressure, Pa (mmHg)	<u>749.2</u>

Orifice Transfer Standard Information					
Serial No.	<u>3864</u>	Slope, mc	<u>0.05914</u>	Intercept, bc	<u>-0.02377</u>
Last Calibration Date:	<u>7-Jan-25</u>	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	<u>7-Jan-26</u>	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	<u>12.6</u>	3.51	59.71	<u>8.3</u>	2.85
2	<u>10.5</u>	3.20	54.54	<u>7.1</u>	2.63
3	<u>8.5</u>	2.88	49.11	<u>5.2</u>	2.25
4	<u>5.3</u>	2.27	38.87	<u>2.8</u>	1.65
5	<u>3.6</u>	1.87	32.10	<u>2.1</u>	1.43

By Linear Regression of Y on X

Slope, mw = 0.0538 Intercept, bw = -0.3556

Correlation coefficient* = 0.9951

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; W = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.92

Remarks: _____

Conducted by: Wong Shing Kwai Signature: [Signature] Date: 11-Jul-25

Checked by: Henry Leung Signature: [Signature] Date: 11-Jul-25

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA20003/44/0030

Project No. KTD1 - Centre of Excellence in Paediatrics (Children's Hospital)
 Date: 11-Jul-25 Next Due Date: 11-Sep-25 Operator: SK
 Equipment No.: A-01-44 Model No.: TE-5170 Serial No. 1316

Ambient Condition			
Temperature, Ta (K)	<u>300.9</u>	Pressure, Pa (mmHg)	<u>749.2</u>

Orifice Transfer Standard Information					
Serial No.	<u>3864</u>	Slope, mc	<u>0.05914</u>	Intercept, bc	<u>-0.02377</u>
Last Calibration Date:	<u>7-Jan-25</u>	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	<u>7-Jan-26</u>	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	<u>13.4</u>	<u>3.62</u>	<u>61.56</u>	<u>9.1</u>	<u>2.98</u>
2	<u>11.4</u>	<u>3.34</u>	<u>56.81</u>	<u>7.3</u>	<u>2.67</u>
3	<u>9.5</u>	<u>3.05</u>	<u>51.90</u>	<u>5.6</u>	<u>2.34</u>
4	<u>6.2</u>	<u>2.46</u>	<u>42.00</u>	<u>3.7</u>	<u>1.90</u>
5	<u>3.6</u>	<u>1.87</u>	<u>32.10</u>	<u>2.1</u>	<u>1.43</u>

By Linear Regression of Y on X

Slope, mw = 0.0516 Intercept, bw = -0.2586

Correlation coefficient* = 0.9961

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation	
From the TSP Field Calibration Curve, take Qstd = 43 CFM	
From the Regression Equation, the "Y" value according to	
$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$	
Therefore, Set Point; W = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ <u>3.94</u>	

Remarks: _____

Conducted by: Wong Shing Kwai Signature: Date: 11-Jul-25

Checked by: Henry Leung Signature: Date: 11-Jul-25

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA20003/41/0030

Project No. KTD 2D - Next to the SOR Office of Trunk Road T2 in Kai Tak Area

Date: 11-Jul-25 Next Due Date: 11-Sep-25 Operator: SK

Equipment No.: A-01-41 Model No.: TE 5170 Serial No. 5280

Ambient Condition			
Temperature, Ta (K)	<u>300.9</u>	Pressure, Pa (mmHg)	<u>749.2</u>

Orifice Transfer Standard Information					
Serial No.	<u>3864</u>	Slope, mc	<u>0.05914</u>	Intercept, bc	<u>-0.02377</u>
Last Calibration Date:	<u>7-Jan-25</u>	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	<u>7-Jan-26</u>	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler					
Calibration Point	Orifice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) X - axis	ΔW (HVS), in. of water	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Y-axis
1	<u>13.6</u>	<u>3.64</u>	<u>62.02</u>	<u>9.4</u>	<u>3.03</u>
2	<u>11.4</u>	<u>3.34</u>	<u>56.81</u>	<u>8.2</u>	<u>2.83</u>
3	<u>9.6</u>	<u>3.06</u>	<u>52.17</u>	<u>6.1</u>	<u>2.44</u>
4	<u>7.2</u>	<u>2.65</u>	<u>45.23</u>	<u>4.2</u>	<u>2.02</u>
5	<u>4.2</u>	<u>2.02</u>	<u>34.64</u>	<u>2.3</u>	<u>1.50</u>

By Linear Regression of Y on X

Slope, mw = 0.0578 Intercept, bw = -0.5358

Correlation coefficient* = 0.9959

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation	
From the TSP Field Calibration Curve, take Qstd = 43 CFM	
From the Regression Equation, the "Y" value according to	
$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$	
Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ <u>3.89</u>	

Remarks: _____

Conducted by: Wong Shing Kwai Signature: [Signature] Date: 11-Jul-25

Checked by: Henry Leung Signature: [Signature] Date: 11-Jul-25

Certificate of Calibration

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler

Description: Digital Dust Indicator Date of Calibration 18-Aug-25
 Manufacturer: Sibata Scientific Technology LTD. Validity of Calibration Record 18-Oct-25
 Model No.: LD-5R
 Serial No.: 4X7589
 Equipment No.: SA-01-12 Sensitivity 1 CPM = 0.001 mg/m³
 High Volume Sampler No.: A-01-03 Before Sensitivity Adjustment 683 CPM
 Tisch Calibration Orifice No.: 3864 After Sensitivity Adjustment 683 CPM

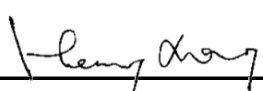
Calibration of 1 hr TSP		
Calibration Point	Laser Dust Monitor	HVS
	Mass Concentration (µg/m ³) X-axis	Mass concentration (µg/m ³) Y-axis
1	33.0	55.0
2	44.0	71.0
3	64.0	106.0
Average	47.0	77.3
By Linear Regression of Y on X Slope, mw = <u>1.6579</u> Intercept, bw = <u>-0.5877</u> Correlation coefficient* = <u>0.9990</u>		
Set Correlation Factor		
Particulate Concentration by High Volume Sampler (µg/m ³)		77.3
Particulate Concentration by Dust Meter (µg/m ³)		47.0
Measureing time, (min)		60.0
Set Correlation Factor, SCF		
SCF = [K=High Volume Sampler / Dust Meter, (µg/m ³)]		<u>1.6</u>

In-house method in according to the instruction manual:

The Dust Monitor was compared with a calibrated High Volume Sampler and The result was used to generate the Correlation Factor (CF) between the Dust Monitor and High Volume Sampler.

Those filter papers are weighted by HOKLAS laboratory (HPCT Litimed)

Calibrated by: 
 Technical Officer (Wong Shing Kwai)

Approved by: 
 Project Manager (Henry Leung)