

### **Certificate of Calibration - Wind Monitoring Station**

Description: Yau Lai Estate, Bik Lai House

Manufacturer: <u>Davis Instruments</u>

Model No.: <u>Davis7440</u>

Serial No.: <u>MC01010A44</u>

Equipment No.: <u>SA-03-04</u>

Date of Calibration <u>17-Feb-2025</u>

Next Due Date <u>17-Aug-2025</u>

#### 1. Performance check of Wind Speed

Wind Sp	peed, 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 Di	rection (°)	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





### RECALIBRATION DUE DATE:

**January 7, 2026** 

# Certificate of Calibration

**Calibration Certification Information** 

Cal. Date: January 7, 2025 Rootsmeter 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	Qstd	$\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right) \left(\frac{Tstd}{Ta}\right)}$		Qa	√∆H(Ta/Pa)				
(m3)	(x-axis)	(y-axis)	Va	(x-axis)	(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				
	m=	2.08969		m=	1.30853				
<b>QSTD</b>	b=	-0.02374	QA	b=	-0.01464				
	r=	0.99985		r=	0.99985				

	Calculations							
	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	Va=	ΔVol((Pa-ΔP)/Pa)					
Qstd=	Vstd/∆Time	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=	$1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$					

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	777					

#### 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

FAX: (513)467-9009

# **High-Volume TSP Sampler** 5-POINT CALIBRATION DATA SHEET



						File No. N	MA20003/18/032
Project No.	CKL 1 - Flat 121	Cha Kwo Ling	Village				
Date:	6-Ma	y-25 Next Due Date:		6-Jul-25		Operator:	SK
Equipment No.:	A-01	-18	Model No.:	TE	5170	Serial No.	0723
			Ambient	Condition			
Temperatur	re Ta (K)	300.7	Pressure, Pa			759.1	
Temperatur	ις, τα (11)	300.7	11055410,14	(11111115)		737.1	
		Or	ifice Transfer Sta	andard Inform	ation		
Serial	No.	3864	Slope, mc	0.05914	Intercept		-0.02377
Last Calibra	tion Date:	7-Jan-25			$c = [\Delta H \times (Pa/76)]$		
Next Calibra	ation Date:	7-Jan-26		$\mathbf{Qstd} = \{ [\Delta \mathbf{H} \ \mathbf{x} ] \}$	x (Pa/760) x (298/	$(Ta)]^{1/2} -bc \} / m$	c
			Calibration of	TSP Sampler			
C-1'1		Or	fice			HVS	
Calibration Point	ation All (arifica)		0) x (298/Ta)] <sup>1/2</sup>	Qstd (CFM) X - axis	ΔW (HVS), in. of water	[ΔW x (Pa/760)	x (298/Ta)] <sup>1/2</sup> <b>Y-</b>
1	13.3	3	3.63	61.75	9.0	,	2.98
2	10.5	3	3.22	54.91	7.2	,	2.67
3	8.4		2.88	49.16	5.2	2.27	
4	6.0	2	2.44	41.61	3.6		1.89
5	3.0	-	1.72	29.54	1.5		1.22
By Linear Regr Slope , mw =	ession of Y on X 0.0554		1	Intercept, bw :	-0.420	95	
Correlation of	coefficient* =	0.	9990	_			
If Correlation C	Coefficient < 0.99	0, check and rec	alibrate.				
			Set Point (	Calculation			
From the TSP Fi	eld Calibration C	urve, take Qstd	= 43 CFM				
From the Regress	sion Equation, th	e "Y" value acco	ording to				
		mw v (	$\mathbf{Qstd} + \mathbf{bw} = [\Delta \mathbf{W}]$	v (Pa/760) v (2	908/Ta)1 <sup>1/2</sup>		
		IIIW X (	ZStu + DW – [ΔW	x (1 a/ /00) x (2	190/1a)j		
Therefore, Se	et Point; W = ( my	$w \times Qstd + bw$	<sup>2</sup> x ( 760 / Pa ) x ( '	Ta / 298) =	3.89		
Remarks:							
•							
	W. G1:		g:	Xr	ρλ	Б.,	CM 25
Conducted by:	Wong Shi	ing Kwal	Signature:		<i>)</i> •	Date:	6-May-25
Checked by:	Henry Leung Signature: Very				Date:	6-May-25	

## High-Volume TSP Sampler 5-POINT CALIBRATION DATA SHEET



File No. MA20003/55/032 Project No. CKL 2 - Flat 103 Cha Kwo Ling Village 6-May-25 Next Due Date: 6-Jul-25 Date: Operator: SK Model No.: TE 5170 Serial No. 1956 Equipment No.: A-01-55 **Ambient Condition** Temperature, Ta (K) 300.7 Pressure, Pa (mmHg) 759.1 **Orifice Transfer Standard Information** 0.05914 Intercept, bc 3864 Slope, mc -0.02377 Serial No.  $mc \times Ostd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ 7-Jan-25 Last Calibration Date: Qstd =  $\{ [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} -bc \} / mc$ 7-Jan-26 Next Calibration Date: **Calibration of TSP Sampler** Orfice Calibration  $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$  $\Delta H$  (orifice), Ostd (CFM)  $\Delta W$  (HVS), in. Point  $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ in. of water X - axis of water Y-axis 1 13.6 3.67 62.44 9.0 2.98 2 11.1 3.31 56.45 7.0 2.63 9.2 3.02 51.43 5.8 2.40 4 5.2 2.27 38.76 2.8 1.66 2.0 1.41 5 3.8 1.94 33.20 By Linear Regression of Y on X Intercept, bw :\_\_\_\_ -0.4130 Slope , mw = 0.0543 Correlation coefficient\* = \*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 x 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 Checked by: Henry Leung

### **High-Volume TSP Sampler**

### 5-POINT CALIBRATION DATA SHEET



File No. MA20003/04/0030

Project No.	KER 1 - Future	Residential Dev		_			
Date:	14-M	-May-25 Next Due Date: 14-Jul-25		Operator:	SK		
Equipment No.:	Equipment No.: A-01-		04 Model No.:		E 5170	Serial No.	10595
			Ambient C	ondition			
Temperatu	re, Ta (K)	300.2	Pressure, Pa	(mmHg)		759.6	
G : 1	NT.		rifice Transfer Star			. 1	0.02277
Serial		3864	Slope, mc	0.05914	Intercept $c = [\Delta H \times (Pa/760)]$		-0.02377
Last Calibra Next Calibra		7-Jan-25 7-Jan-26			$(Pa/760) \times (298/7)$		
Next Calibra	ation Date:	/-Jan-20	1	Qstu – <sub>[[ΔII X</sub>	(1 a/ 700) X (290/	1a)] -bc//m	
		•	Calibration of 7	TSP Sampler			
Calibration		0	rfice	•		HVS	
Point	ΔH (orifice), in. of water	[ΔH x (Pa/7	60) x (298/Ta)] <sup>1/2</sup>	Qstd (CFM) X - axis	ΔW (HVS), in. of water		50) x (298/Ta)] <sup>1/2</sup> -axis
1	12.8		3.56	60.66	8.2	2	2.85
2	10.6		3.24	55.24	7.0	,	2.64
3	8.6		2.92	49.79	5.1	2	2.25
4	5.0		2.23	38.06	2.9		1.70
5	3.8		1.94	33.23	2.0		1.41
By Linear Regr Slope, mw = Correlation *If Correlation C	0.0529 coefficient* =		0.9981	Intercept, bw :	-0.340	00	
			Set Point Ca	alculation			
From the TSP Fi From the Regres Therefore, Se	sion Equation, th	mw x 0			98/Ta)] <sup>1/2</sup> 3.78		
Remarks:  Conducted by:	Wong Si	ning Kwai	Signature:		W-	Date:	14-May-25
Checked by:	Henry	Leung	Signature:	\-len	, Don	Date:	14-May-25

### **High-Volume TSP Sampler**

### 5-POINT CALIBRATION DATA SHEET



File No. MA20003/44/0029

Project No.	KTD1 - Centre	of Excellence in		_			
Date:	14-May-25		Next Due Date: 14-Jul-25		-Jul-25	Operator:	
Equipment No.:	A-0			.: TE-5170		Serial No.	1316
			Ambient C	ondition			
Temperatur	re, Ta (K)	300.2	Pressure, Pa			759.6	
*	, , , ,		,	· · · · · · ·			
		Or	ifice Transfer Star	ndard Informa	ation		
Serial	No.	3864	Slope, mc	0.05914	Intercept	t, bc	-0.02377
Last Calibra	ation Date:	7-Jan-25	1	mc x Qstd + bo	$c = [\Delta H \times (Pa/760]]$	)) x (298/Ta)] <sup>1/</sup>	2
Next Calibra	ation Date:	7-Jan-26		$Qstd = \{ [\Delta H \ x ] \}$	(Pa/760) x (298/	Γa)] <sup>1/2</sup> -bc} / m	c
			Calibration of	TSP Sampler			
Calibration		Oı	fice			HVS	
Point	Calibration Point  AH (orifice), in. of water  [ΔH		[ΔH x (Pa/760) x (298/Ta)] <sup>1/2</sup>		ΔW (HVS), in. of water		50) x (298/Ta)] <sup>1/2</sup> 7 <b>-axis</b>
1	13.6		3.67	62.51	9.0		2.99
2	11.5		3.38	57.52	7.4		2.71
3	9.4		3.05	52.04	5.6		2.36
4	6.0		2.44	41.66	3.5		1.86
5	3.7		1.92	32.80	2.0	1.41	
Slope , mw =	ession of Y on X 0.0528 coefficient* =	_	.9988	Intercept, bw :	-0.339	06	
*If Correlation C	Coefficient < 0.99	0, check and rec	calibrate.	•			
			Set Point Ca	alculation			
	eld Calibration C		= 43 CFM				
From the Regres	sion Equation, th	e "Y" value acco	ording to				
		mw x (	$\mathbf{pstd} + \mathbf{bw} = [\Delta \mathbf{W} \ \mathbf{x}]$	(Pa/760) x (29	98/Ta)] <sup>1/2</sup>		
		A \		(1 til 700) A (2)	· ( · ( · ( · ( · ( · ( · ( · ( · ( · (		
Therefore, Se	et Point; W = ( m	w x Qstd + bw)	$^{2}$ x ( 760 / Pa ) x ( $^{7}$	$\Gamma a / 298) =$	3.76		
Remarks:							
remarks.							
				b	λc		
Conducted by:	Wong Sh	ing Kwai	Signature:		<u> </u>	Date:	14-May-25
				1 0	- /		
Checked by:	Henry	Leung	Signature:	1-1	- M2-7	Date:	14-May-25

### High-Volume TSP Sampler 5-POINT CALIBRATION DATA SHEET



File No. MA20003/41/0029 KTD 2D - Next to the SOR Office of Trunk Road T2 in Kai Tak Area Project No. 14-May-25 Next Due Date: 14-Jul-25 Operator: SK Date: Equipment No.: A-01-41 Model No.: TE 5170 Serial No. 5280 **Ambient Condition** Temperature, Ta (K) 300.2 Pressure, Pa (mmHg) 759.6 **Orifice Transfer Standard Information** 0.05914 Intercept, bc 3864 Slope, mc -0.02377 Serial No.  $mc \times Ostd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ 7-Jan-25 Last Calibration Date: Ostd =  $\{ [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} -bc \} / mc$ 7-Jan-26 Next Calibration Date: **Calibration of TSP Sampler** Orfice Calibration  $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$  $\Delta H$  (orifice), Ostd (CFM)  $\Delta W$  (HVS), in.  $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ Point in. of water X - axis of water Y-axis 3.04 1 13.7 3.69 62.74 9.3 2 11.5 3.38 57.52 8.0 2.82 3.07 52.31 6.2 2.48 4 7.0 2.64 44.96 4.3 2.07 4.0 2.0 5 1.99 34.09 1.41 By Linear Regression of Y on X Slope , mw = 0.0577 Intercept, bw : -0.5406 Correlation coefficient\* = \*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 x Qstd + bw =  $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Therefore, Set Point;  $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) = 3.79$ Remarks:

Conducted by: Wong Shing Kwai

Checked by: Henry Leung