

Certificate of Calibration - Wind Monitoring Station

Description: Yau Lai Estate, Bik Lai House

Manufacturer: <u>Davis Instruments</u>

Model No.: Davis7440

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

Equipment No.: SA-03-04

Date of Calibration <u>17-Aug-2024</u>

Next Due Date <u>17-Feb-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	1.6	-0.1
2.5	2.3	0.2
4.0	4.0	0.0

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 15, 2025

Certificate of Calibration

Calibration Certification Information

Cal. Date: January 15, 2024

Rootsmeter S/N: 438320

Ta: 294

°K

Operator: Jim Tisch

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Pa: 755.4

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	1.4380	3.3	2.00
2	3	4	1	1.0270	6.4	4.00
3	5	6	1	0.9180	8.0	5.00
4	7	8	1	0.8750	8.9	5.50
5	9	10	1	0.7230	12.9	8.00

	Data Tabulation								
Vstd	Qstd	$\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right) \left(\frac{Tstd}{Ta}\right)}$		Qa	$\sqrt{\Delta H (Ta/Pa)}$				
(m3)	(x-axis)	(y-axis)	Va	(x-axis)	(y-axis)				
1.0031	0.6975	1.4195	0.9956	0.6924	0.8823				
0.9989	0.9727	2.0075	0.9915	0.9655	1.2477				
0.9968	1.0858	2.2444	0.9894	1.0778	1.3950				
0.9956	1.1378	2.3539	0.9882	1.1294	1.4631				
0.9903	1.3697	2.8390	0.9829	1.3595	1.7645				
	m=	2.11196		m=	1.32248				
QSTD	b=	-0.05043	QA	b=	-0.03134				
	r=	0.99998	4 1	r=	0.99998				

	Calculatio	ns		
Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	Va=	ΔVol((Pa-ΔP)/Pa)	
Qstd=	Vstd/∆Time	Qa= Va/ΔTime		
	For subsequent flow ra	te calculatio	ns:	
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

Tisch Environmental, Inc. 145 South Miami Avenue Village of Cleves, OH 45002

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5-POINT CALIBRATION DATA SHEET



File No. MA20003/41/0025

Project No.	KTD 2D - Next	to the SOR Offic	ce of Trunk Road T	2 in Kai Tak A	area				
Date:	11-Sep-24		11-Sep-24 Next D		Next Due Date:	Date: 11-Nov-24 No.: TE 5170		Operator:	SK
Equipment No.:	A-0	01-41	Model No.:	Serial No.	5280				
			Ambient C	ondition					
Temperatui	re, Ta (K)	303.4	Pressure, Pa			756.1			
•	: -								
		Or	ifice Transfer Star	ndard Informa	ation				
Serial No. 3864 Slope, mc 0.05976 Intercept, bc						-0.05018			
Last Calibra	tion Date:	15-Jan-24	4		$c = [\Delta H \times (Pa/760)]$				
Next Calibra	ation Date:	14-Jan-25	($\mathbf{Qstd} = \{ [\Delta \mathbf{H} \ \mathbf{x}] \}$	(Pa/760) x (298/7	Γa)] ^{1/2} -bc} / m	ıc		
			Calibration of T	ΓSP Sampler					
Calibration		Or	fice			HVS			
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	50) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of water		60) x (298/Ta)] ^{1/2} /-axis		
1	14.2		3.73	63.17	9.5		3.05		
2	11.4		3.34	56.69	8.2		2.83		
3	9.6		3.06	52.09	6.2		2.46		
4	7.0	:	2.62	44.60	4.4		2.07		
5	3.9		1.95	33.51	2.1		1.43		
By Linear Regr Slope , mw = Correlation of *If Correlation C	0.0558 coefficient* =	0	.9964		-0.423	9			
From the TSP Fig	eld Calibration (Curve take Octd		ilculation					
From the Regress									
Tom the Regies	oron Equation, ti	ic i varut acci	name to						
		mw x Q	$\mathbf{Qstd} + \mathbf{bw} = [\Delta \mathbf{W} \ \mathbf{x}]$	(Pa/760) x (29	98/Ta)] ^{1/2}				
Therefore, Se	et Point; W = (m	nw x Qstd + bw)	² x (760 / Pa) x (7	Ta / 298) =	4.00				
Remarks:									
Conducted by:	Wong Sh	ning Kwai	Signature:	K	<u> </u>	Date:	11-Sep-24		
Checked by:	Henry	Leung	Signature:	-Pan	y May	Date:	11-Sep-24		

5-POINT CALIBRATION DATA SHEET



Date: 11-Sep-24

File No. MA20003/44/0025 Project No. KTD1 - Centre of Excellence in Paediatrics (Children's Hospital) 11-Sep-24 Next Due Date: 11-Nov-24 Operator: SK Date: Model No.: TE-5170 Equipment No.: A-01-44 Serial No. <u>1316</u> **Ambient Condition** Temperature, Ta (K) 303.4 756.1 Pressure, Pa (mmHg) **Orifice Transfer Standard Information** 0.05976 -0.05018 Serial No. 3864 Slope, mc Intercept, bc $mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ Last Calibration Date: 15-Jan-24 Qstd = $\{ [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} -bc \} / mc$ Next Calibration Date: 14-Jan-25 **Calibration of TSP Sampler** Orfice HVS Calibration $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ ΔH (orifice), Qstd (CFM) ΔW (HVS), in. Point $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ in. of water X - axis of water Y-axis 1 13.9 3.69 62.51 9.6 3.06 2 11.3 3.32 56.44 7.4 2.69 3 9.2 3.00 51.01 5.5 2.32 4 6.5 2.52 43.01 3.8 1.93 3.8 1.93 33.08 2.1 1.43 By Linear Regression of Y on X Slope , mw = _ 0.0552 Intercept, bw : -0.4294 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 Ostd + bw = $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ Therefore, Set Point; W = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.86 Remarks:

Conducted by: Wong Shing Kwai

Checked by: Henry Leung

5-POINT CALIBRATION DATA SHEET



File No. MA20003/04/0026

Project No.	KER 1 - Future	Residential Deve	elopment at Kerry (Godown		-	
Date:	11-Sep-24		Next Due Date:	12-Nov-24		Operator:	SK
Equipment No.:	A-0	1-04	Model No.:	:: TE 5170		Serial No.	10595
			Ambient C	ondition			
Temperatur	re, Ta (K)	303.4	Pressure, Pa			756.1	
•	· · · · · · ·		,	`			
		Or	ifice Transfer Star	ndard Informa	ition		
Serial	No.	3864	Slope, mc	0.05976	Intercept		-0.05018
Last Calibra	ation Date:	15-Jan-24			$c = [\Delta H \times (Pa/760]]$		
Next Calibra	ation Date:	14-Jan-25	($\mathbf{Qstd} = \{ [\Delta \mathbf{H} \ \mathbf{x}] \}$	(Pa/760) x (298/7	Γa)] ^{1/2} -bc} / me	c
			Calibration of	TSP Sampler			
Calibration		Or	fice	Г		HVS	47
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	50) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of water		50) x (298/Ta)] ^{1/3} -axis
1	13.1		3.58	60.71	8.8	2	2.93
2	10.7		3.23	54.95	7.0		2.62
3	8.7	:	2.92	49.63	5.2	2.25	
4	5.6		2.34	39.98	3.3	1.80	
5	3.8		1.93	33.08	2.0		1.40
By Linear Regr Slope , mw =	0.0551	_		Intercept, bw :	-0.428	34	
	coefficient* =		.9988	=			
*If Correlation C	Coefficient < 0.99	00, check and rec	calibrate.				
			Set Point Ca	alculation			
From the TSP Fi	eld Calibration (Curve, take Ostd					
From the Regress							
C	1 ,		-		4.0		
		mw x Q	$\mathbf{pstd} + \mathbf{bw} = [\mathbf{\Delta W} \ \mathbf{x}]$	(Pa/760) x (29	08/Ta)] ^{1/2}		
Therefore, Se	et Point; W = (m	w x Qstd + bw)	² x (760 / Pa) x (7	Γa / 298) =	3.86		
Remarks:							
				10	ما		
Conducted by:	Wong Sh	ing Kwai	Signature:		<u> </u>	Date:	11-Sep-24
			-	1			
Checked by:	Henry	Leung	Signature:	1-P-	- Mars	Date:	11-Sep-24

5-POINT CALIBRATION DATA SHEET



File No. MA20003/55/028 Project No. CKL 2 - Flat 103 Cha Kwo Ling Village 4-Sep-24 Next Due Date: 4-Nov-24 Operator: SK Date: Equipment No.: A-01-55 Model No.: TE 5170 Serial No. 1956 **Ambient Condition** Temperature, Ta (K) 302.7 Pressure, Pa (mmHg) 751.8 **Orifice Transfer Standard Information** 0.05976 Intercept, bc -0.05018 3864 Slope, mc Serial No. mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ Last Calibration Date: 15-Jan-24 Qstd = $\{ [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} -bc \} / mc$ Next Calibration Date: 14-Jan-25 **Calibration of TSP Sampler** Orfice HVS Calibration $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ ΔH (orifice), Ostd (CFM) ΔW (HVS), in. Point $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ in. of water X - axis of water Y-axis 13.6 3.64 61.74 9.4 3.03 1 11.4 3.33 56.60 7.4 2.68 51.20 3.01 6.0 2.42 4 5.6 2.34 39.92 2.9 1.68 5 3.6 1.87 32.17 2.0 1.40 By Linear Regression of Y on X Slope , mw = 0.0562 Intercept, bw : -0.4760 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; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.87 Remarks: Signature: Date: 4-Sep-24

Signature: Date: 4-Sep-24 Conducted by: Wong Shing Kwai Checked by: Henry Leung

High-Volume TSP Sampler 5-POINT CALIBRATION DATA SHEET



						File No. N	MA20003/18/028
Project No.	CKL 1 - Flat 12	1 Cha Kwo Ling	, Village			_	
Date:	4-Sep-24		Next Due Date: 4-Nov-2		Jov-24	Operator:	SK
quipment No.: A-(5170		
			Ambient	Condition			
Temperatur	re, Ta (K)	302.7	Pressure, Pa	(mmHg)		751.8	
G : 1	127		rifice Transfer Sta	1		. 1	0.05010
Serial		3864 15 Jan 24	Slope, mc	0.05976	Intercept $c = [\Delta H \times (Pa/76)]$		-0.05018
Last Calibra Next Calibra		15-Jan-24 14-Jan-25			к (Pa/760) x (298		
Next Canora	ation Date.	14-Jan-23		Qstu – ([ΔH 2	(1 a/ 100) A (2)0	/1a)j -bcj/iii	
		•	Calibration of	f TSP Sampler			
Calibration		Or	fice			HVS	
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	50) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of water	- , ,	x (298/Ta)] ^{1/2} Y- axis
1	13.7		3.65	61.96	9.3		3.01
2	10.3		3.17	53.84	7.2		2.65
3	8.6		2.89	49.27	5.4		2.29
4	6.3		2.48	42.29	3.5		1.85
5	3.7		1.90	32.60	1.9		1.36
By Linear Regr	ession of Y on Y	X					
Slope, mw =				Intercept, bw :	-0.549)1	
Correlation	coefficient* =	0	.9969	_			
*If Correlation C	Coefficient < 0.99	90, check and rec	calibrate.				
			Set Point (Calculation			
From the TSP Fi	ield Calibration (Curve, take Qstd	= 43 CFM				
From the Regres	ssion Equation, th	ne "Y" value acco	ording to				
			$Qstd + bw = [\Delta W]$	(Do/760) (2	000/T ₂)1 ^{1/2}		
		mw x ($Qsta + bw = [\Delta vv]$	X (Pa//60) X (2	298/1a)j		
Therefore, Se	et Point; W = (m	nw x Qstd + bw)	² x (760 / Pa) x (Ta / 298) =	3.87		
							_
Remarks:							
				h	٦/		
Conducted by:	Wong Sh	ning Kwai	Signature		<u> </u>	Date:	4-Sep-24
		_		\ 0	~ -		
Checked by:	by: Henry Leung		Signature	tem	y way	Date:	4-Sep-24