

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 19-Feb-2022

Next Due Date 19-Aug-2022

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	1.5	0.0
2.5	2.5	0.0
4.2	4.3	-0.1

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



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Manufacturer: <u>Davis Instruments</u>

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Date of Calibration <u>20-Aug-2021</u>

Next Due Date <u>20-Feb-2022</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	1.5	0.0
2.8	2.7	0.1
4.0	4.1	-0.1

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: Approved by: Approved by: Henry Leung





RECALIBRATION **DUE DATE:**

January 31, 2023

Calibration Certification Information

Cal. Date: January 31, 2022 Rootsmeter S/N: 438320

Calibrator S/N: 3864

Ta: 294

Pa: 752.6

°K

Operator: Jim Tisch Calibration Model #:

TE-5025A

mm Hg

Run	Vol. Init (m3)	Vol. Final (m3)			ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4490	3.2	2.00
2	3	4	1	1.0320	6.4	4.00
3	5	6	1	0.9160	7.9	5.00
4	7	8	1	0.8730	8.8	5.50
5	9	10	1	0.7230	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)			
0.9995	0.6898	1.4169	0.9957	0.6872	0.8839			
0.9952	0.9643	2.0037	0.9915	0.9608	1.2500			
0.9932	1.0843	2.2402	0.9895	1.0802	1.3976			
0.9920	1.1363	2.3496	0.9883	1.1321	1.4658			
0.9868	1.3649	2.8337	0.9831	1.3598	1.7678			
	m=	2.09281		m=	1.31048			
QSTD	b=	-0.02426	QA [b=	-0.01514			
٠,٠,٠	r=	0.99993		r=	0.99993			

	Calculatio	ns			
Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	Va=	ΔVol((Pa-ΔP)/Pa)		
Qstd=	Vstd/∆Time	td/ΔTime Qa= Va/ΔTime			
	For subsequent flow ra	ite 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: calibrate	or manometer reading (in H2O)
ΔP: rootsme	ter manometer reading (mm Hg)
Ta: actual ab	solute temperature (°K)
Pa: actual ba	rometric pressure (mm Hg)
b: intercept	11-
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. MA20003/41/0010

Project No.	KTD 2D - Next	to the SOR Offic	ce of Trunk Road T	2 in Kai Tak A	area				
Date:	11-Jan-22		11-Jan-22 Next		Next Due Date:	11-	Mar-22	Operator:	SK
)1-41			E 5170	_	5280		
			Ambient C	ondition	ı				
Temperatu	re, Ta (K)	293	Pressure, Pa	(mmHg)		764			
		0		1 17 0					
0 : 1	N		ifice Transfer Star			1	0.00212		
Serial		3864	Slope, mc	0.05846	Intercept $c = [\Delta H \times (Pa/760)]$		-0.00313		
Last Calibra		11-Jan-21	1		с — [ДН х (Га/760 (Ра/760) х (298/]				
Next Calibra	ation Date:	11-Jan-22	<u> </u>	<u> γεια – ξ[Δ11 χ</u>	(1 a/ /00) X (296/ I	[a)] -bc ₃ /1	iic		
		·	Calibration of T	ΓSP Sampler					
0.17		Or	fice			HVS			
Calibration Point	ΔH (orifice), in. of water		50) x (298/Ta)] ^{1/2}	Qstd (CFM) X - axis	ΔW (HVS), in. of water	[ΔW x (Pa/	760) x (298/Ta)] ^{1/2} Y-axis		
1	13.1		3.66	62.66	9.2		3.07		
2	11.4		3.41	58.45	7.4		2.75		
3	8.2		2.90	49.58	5.9		2.46		
4	6.0		2.48	42.42	4.4		2.12		
5	3.0		1.75	30.01	2.3		1.53		
By Linear Regr Slope , mw = Correlation *If Correlation C	0.0452 coefficient* =	_	.9966	ntercept, bw =	0.186	9			
			Set Point Ca	lculation					
		Curve, take Qstd							
From the Regres	sion Equation, t	he "Y" value acco	ording 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 = (n	nw x Qstd + bw)	² x (760 / Pa) x (7	Γa / 298) =	4.44	_			
Remarks:									
Conducted by:	Wong SI	ning Kwai	Signature:	K	<u></u>	Date:	11-Jan-22		
Checked by:	Henry	Leung	Signature:	\-len	y day	Date: _	11-Jan-22		

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA20003/44/0011

Project No.	KTD1 - Centre	of Excellence in	Paediatrics (Childr	en's Hospital)			
Date:	11-J	an-22	Next Due Date:	11-	Mar-22	Operator:	SK
Equipment No.:	A-0	01-44	Model No.:	TE	TE-5170		1316
			Ambient C	ondition			
Temperatu	Temperature, Ta (K) 294 Pressure, Pa (mmHg)					763	
		Or	ifice Transfer Star	ndard Informa	ation		
Serial	l No.	3864	Slope, mc	0.05846	Intercept		-0.00313
Last Calibra	ation Date:	11-Jan-21	1		$c = [\Delta H \times (Pa/760)]$		
Next Calibr	ration Date:	11-Jan-22		$Qstd = \{ [\Delta H \ x]$	(Pa/760) x (298/7	Γa)] ^{1/2} -bc} / n	ıc
		_	Calibration of	TSP Sampler	I		
Calibration	AII (authan)		fice	O-41 (CDA)	AM (HING)	HVS	(200/E) 31//
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} Y-axis
1	13.2		3.67	62.75	9.6		3.13
2	11.0		3.35	57.28	7.4		2.74
3	8.4		2.92	50.07	5.6		2.39
4	5.6		2.39	40.89	3.3		1.83
5	3.2		1.80	30.92	1.8		1.35
By Linear Regr Slope , mw =	· ression of Y on 2 0.0554	X	1	Intercept, bw :	-0.392	26	
Correlation			.9985	1 /			
		90, check and red		•			
			Set Point Ca	alculation			
From the TSP Fi	ield Calibration (Curve, take Qstd					
		he "Y" value acco					
	•		_		1/2		
		mw x ($\mathbf{Qstd} + \mathbf{bw} = [\Delta \mathbf{W} \ \mathbf{x}]$	(Pa/760) x (29	98/Ta)] ^{1/2}		
Therefore, Se	et Point; W = (m	nw x Qstd + bw)	2 x (760 / Pa) x (7	Γa / 298) =	3.89	_	
Remarks:							
Conducted by:	Wong Sł	ning Kwai	Signature:	<i>\X</i>	<u></u>	Date: _	11-Jan-22
Checked by:	Henry	Leung	Signature:	1-Pa	1 (X)	Date:	11-Jan-22

High-Volume TSP Sampler

5-POINT CALIBRATION DATA SHEET



File No. MA20003/04/0010

Project No.	KER 1 - Future	Residential Dev	elopment at Kerry (Godown			
Date:	11-Jan-22		Next Due Date:	Next Due Date: 11-Mar-22		Operator:	SK
Equipment No.:	A-0	A-01-04 Model No.: TE 5170		E 5170	Serial No. 10595		
			Ambient C	ondition			
Temperatu	re, Ta (K)	293	Pressure, Pa	(mmHg)		764	
			ifice Transfer Star				
Seria		3864	Slope, mc	0.05846	Intercept		-0.00313
Last Calibr	1	11-Jan-21			$c = [\Delta H \times (Pa/760)]$		
Next Calibr	ration Date:	11-Jan-22		$Qstd = \{ [\Delta H \ x]$	(Pa/760) x (298/7	Γa)] ^{1/2} -bc} / mo	:
			Calibration of	ISP Sampler		****	
Calibration Point	ΔH (orifice),		fice 60) x (298/Ta)] ^{1/2}	Qstd (CFM)	ΔW (HVS), in.	HVS [ΔW x (Pa/76	0) x (298/Ta)] ^{1/2}
	in. of water	[ZII X (I a/ /\	(296/1a)]	X - axis	of water	Y-	-axis
1	13.1		3.66	62.66	9.2	3	5.07
2	10.4		3.26	55.83	7.0	2	2.68
3	8.2		2.90	49.58	5.6	2	2.39
4	5.2		2.31	39.50	3.2	1	.81
5	3.0		1.75	30.01	2.1	1	.47
Slope , mw = Correlation	coefficient < 0.9		.9970	Intercept, bw :	-0.080	3	
			Set Point Ca	alculation			
	ield Calibration (ssion Equation, tl	ne "Y" value acc		(Pa/760) x (29	98/Ta)] ^{1/2}		
Therefore, So	et Point; W = (n	nw x Qstd + bw)	² x (760 / Pa) x (7	Га / 298) =	4.14		
Remarks:							
Conducted by:	Wong Sl	ning Kwai	Signature:	\(\frac{1}{2}\)	N -	Date:	11-Jan-22
Checked by:	Henry	Leung	Signature:	-len	y chang	Date:	11-Jan-22

High-Volume TSP Sampler 5-POINT CALIBRATION DATA SHEET



File No. MA20003/55/0012

Project No.	CKL 2 - Flat 10						
Date:	6-Ja	6-Jan-22		6-N	[ar-22 Operator:		SK
Equipment No.:	A-()1-55	Model No.:	TE	TE 5170		1956
Т	T. (II)	20.4	Ambient C			7.00	
Temperatu	re, 1a (K)	294	Pressure, Pa	(mmHg)		762	
		Or	ifice Transfer Star	ndard Informa	ation		
Serial	l No.	3864	Slope, mc	0.05846	Intercept	, bc	-0.00313
Last Calibra	ation Date:	11-Jan-21	•		$c = [\Delta H \times (Pa/760)]$		
Next Calibr	ation Date:	11-Jan-22		$Qstd = \{ [\Delta H \ x]$	(Pa/760) x (298/7	[a)] ^{1/2} -bc} / mo	
	1		Calibration of	TSP Sampler			
Calibration	ΔH (orifice),		fice	Qstd (CFM)	ΔW (HVS), in.	HVS	0) x (298/Ta)] ^{1/2}
Point	in. of water	[ΔH x (Pa/76	$(50) \times (298/Ta)]^{1/2}$	X - axis	of water		0) X (298/14)] -axis
1	12.9		3.62	61.99	10.0	3	3.19
2	10.7		3.30	56.46	7.6	2	2.78
3	8.4		2.92	50.03	6.0	2	2.47
4	5.5		2.36	40.50	3.6	1	.91
5	2.9		1.72	29.42	1.9	1	.39
-	ression of Y on 2	X	,		0.255	-	
Slope, mw =		_		Intercept, bw :	-0.255	97	
	coefficient* =	90, check and red	.9977				
TI Correlation C	Joennelent < 0.9	90, Check and lec	anorate.				
			Set Point Ca	alculation			
From the TSP Fi	ield Calibration (Curve, take Qstd					
From the Regres	sion Equation, t	he "Y" value acco	ording to				
				(D. /5(0) (2)	NO/TE >11/2		
		mw x C	$Qstd + bw = [\Delta W x]$	(Pa//60) x (29	98/1a)]		
Therefore, Se	et Point; W = (n	nw x Qstd + bw)	² x (760 / Pa) x (7	Γa / 298) =	4.31		
Remarks:							
remarks.							
Can du ata d han	Wana Cl	hina Vi	C:	X	λ	Data	6-Jan-22
Conducted by:	Wong Sl	mng Kwai	Signature:			Date:	U-Jaii-22
Checked by	Henry	/ Leung	Signature:	10	N. a	Data	6-Jan-22
Checked by:	110111	Louing	. Signature:	- ten	7 m	Date	U-Jan-22

High-Volume TSP Sampler





						File No. N	4A20003/18/0012	
Project No.	CKL 1 - Flat 12	1 Cha Kwo Ling	Village					
Date:			Next Due Date: 6-1		Nor 22	Operator	S.K.	
	6-Jan-22 A-01-18							
Equipment No.:			Model No.:	TE	5170	Serial No. 0723		
			Ambiant	Candition				
Temperatu	ra Ta (K)	294	Ambient Condition Pressure, Pa (mmHg)			763		
Temperatu	ic, ia (K)	234	Tressure, 1 a	(IIIIIIII)		703		
		Oı	rifice Transfer St	andard Inform	ation			
Serial No.		3864			Intercept, bc -0.00313			
Last Calibration Date:		11-Jan-21	11-Jan-21		mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:		11-Jan-22		Qstd = $\{ [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} -bc \} / mc$				
	1		Calibration of	TSP Sampler				
Calibration Point			rfice		HVS			
	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	13.0		3.64	62.27	9.8	3.16		
2	10.3	3.24		55.43	8.0	2.85		
3	8.5	2.94		50.36	5.9	2.45		
4	6.2	2.51		43.02	4.0	2.02		
5	3.4	1.86		31.87	1.9	1.39		
				•				
By Linear Regr	ession of Y on Y	ζ.						
Slope, mw = 0.0595		. 1		Intercept, bw =		.5157		
Correlation	coefficient* =	0	.9980	_				
If Correlation C	Coefficient < 0.99	00, check and red	calibrate.					
	:-14 C-1:h	4-1 O-4-1		Calculation				
	ield Calibration (-						
from the Regres	ssion Equation, th	ie " i " value acc	ording to					
		mw x	$Qstd + bw = [\Delta W]$	x (Pa/760) x (2	298/Ta)] ^{1/2}			
			2					
Therefore, So	et Point; W = (m	w x Qstd + bw)	² x (760 / Pa) x (Ta / 298) =	4.10	<u> </u>		
Remarks:								
				10	. 1			
Conducted by:	Wong Shing Kwai		Signature:		<u>}</u>	Date:	6-Jan-22	
, .								
Checked by:	y: Henry Leung		Signature: 100		Date:	6-Jan-22		