5-POINT CALIBRATION DATA SHEET



Date:

File No. MA20003/44/0003 KTD1 - Centre of Excellence in Paediatrics (Children's Hospital) Project No. 3-Oct-20 Next Due Date: 3-Dec-20 Operator: SK Date: Equipment No.: A-01-44 TE-5170 _____ Serial No. ____ 1316 Model No.: **Ambient Condition** 301.3 758.4 Temperature, Ta (K) Pressure, Pa (mmHg) **Orifice Transfer Standard Information** Serial No. 3746 Slope, mc 0.0592 Intercept, bc -0.02740 mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ 17-Jan-20 Last Calibration Date: Qstd = $\{ [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} -bc \} / mc$ Next Calibration Date: 17-Jan-21 **Calibration of TSP Sampler** Orfice HVS Calibration ΔH (orifice), $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ 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 2.91 1 12.8 3.55 60.50 8.6 2 10.3 3.19 54.32 6.5 2.53 4.9 7.9 2.79 47.63 2.20 3 5.8 2.39 3.3 1.80 4 40.88 5 3.0 1.72 29.53 1.8 1.33 By Linear Regression of Y on X Slope, $mw = \underline{0.0511}$ Intercept, bw = -0.2236 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 = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.95 Remarks: Conducted by: SK Wong Signature: 3 October 2020 Date: 3 October 2020

5-POINT CALIBRATION DATA SHEET



File No. MA20003/41/0002

Project No.	KTD 2c - G/IC Zone next to Kwun Tong Bypass (Next to the Kowloon Bay Sewage Interception						Station)
Date:	3-0	et-20	Next Due Date:	3-Dec-20		Operator:	SK
Equipment No.:	A-(01-41	Model No.:	TE	E 5170	Serial No.	5280
			Ambient C	ondition			
Temperatur	re, Ta (K)	301.3	Pressure, Pa	(mmHg)		758.4	
			ifice Transfer Star			_	
		3746	Slope, mc 0.0592 Intercept, by 0.0592 $\mathbf{mc} \mathbf{x} \mathbf{Qstd} + \mathbf{bc} = [\Delta \mathbf{H} \mathbf{x} (\mathbf{Pa}/760)]$				-0.0274
Last Calibra		17-Jan-20	ľ	nc x Qstd + bo	$c = [\Delta H \times (Pa)^{7} + (Pa)^{7}]$ $(Pa)^{7} + (Pa)^{7} + (Pa)^{7$	(298/Ta) (1/2 ba)	J
Next Calibra	ation Date:	17-Jan-21	<u> </u>	$Qsta = \{ \Delta H X$	(Pa//00) X (298/.	rajj -bc _{}/}	inc
			Calibration of T	ΓSP Samnler			
C-1th of		Oı	fice	- 31 Sumpici		HVS	
Calibration Point	ΔH (orifice), in. of water		60) 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	13.6		3.66	62.35	6.6		2.55
2	11.0		3.29	56.12	5.3		2.29
3	8.0		2.81		4.1		2.01
4	4.6		2.13		2.6		1.60
5	2.5		1.57		1.8		1.33
By Linear Regr		X	_				
Slope, mw =		_		ntercept, bw	0.374	4	
If Correlation C	coefficient =		.9984	•			
"II Correlation C	oemcient < 0.9	90, check and rec	canorate.				
			Set Point Ca	alculation			
From the TSP Fi	eld Calibration	Curve, take Qstd					
From the Regress	sion Equation, t	he "Y" value acc	ording to				
· ·	•		-		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 = (n	nw x Qstd + bw)	² x (760 / Pa) x (7	Γa / 298) =	3.49		
Remarks:							
Conducted by:	SK Wong	Signature:		.•		Date:	3 October 2020
Checked by:	Henry Leung	Signature:	- land	Xoz		Date:	3 October 2020
			` /	1			

5-POINT CALIBRATION DATA SHEET



06 November 2020

Date:

File No. MA20003/18/0005 Project No. CKL 1 - Flat 121 Cha Kwo Ling Village 6-Nov-20 Next Due Date: 6-Jan-21 Operator: SK Date: Equipment No.: A-01-18 TE 5170 _____ Serial No. ____ 0723 Model No.: **Ambient Condition** 297.7 761.9 Temperature, Ta (K) Pressure, Pa (mmHg) **Orifice Transfer Standard Information** Serial No. 3746 Slope, mc 0.0592 Intercept, bc -0.0274 mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ Last Calibration Date: 17-Jan-20 Qstd = $\{ [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} -bc \} / mc$ Next Calibration Date: 17-Jan-21 **Calibration of TSP Sampler** Orfice HVS Calibration ΔH (orifice), $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ 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 13.8 3.72 63.32 10.1 3.18 2 11.2 3.35 57.09 7.6 2.76 8.4 2.90 49.51 6.0 2.45 3 5.3 2.31 3.6 1.90 4 39.42 5 3.1 1.76 30.26 1.9 1.38 By Linear Regression of Y on X Slope , mw = ______0.0533 Intercept, bw = -0.2162 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 = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.29 Remarks: Conducted by: SK Wong Signature: 06 November 2020 Date:

5-POINT CALIBRATION DATA SHEET



06 November 2020

Date:

File No. MA20003/55/0005 Project No. CKL 2 - Flat 103 Cha Kwo Ling Village 6-Nov-20 Next Due Date: 6-Jan-21 Operator: SK Date: Equipment No.: A-01-55 TE 5170 Serial No. 1956 Model No.: **Ambient Condition** 297.7 761.9 Temperature, Ta (K) Pressure, Pa (mmHg) **Orifice Transfer Standard Information** Serial No. 3746 Slope, mc 0.0592 Intercept, bc -0.0274 mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ 17-Jan-20 Last Calibration Date: Qstd = $\{ [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} -bc \} / mc$ Next Calibration Date: 17-Jan-21 **Calibration of TSP Sampler** Orfice HVS Calibration ΔH (orifice), $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ 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 9.6 1 14.5 3.81 64.90 3.10 2 11.3 3.37 57.35 7.0 2.65 8.4 2.90 49.51 5.6 2.37 3 2.33 5.4 3.5 1.87 4 39.78 5 3.1 1.76 30.26 2.2 1.49 By Linear Regression of Y on X Slope , mw = _____0.0461 Intercept, bw = 0.0661 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; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 4.19 Remarks: Conducted by: SK Wong Signature: 06 November 2020 Date:

5-POINT CALIBRATION DATA SHEET



File No. MA20003/04/0002 Project No. KER 1 - Future Residential Development at Kerry Godown 3-Oct-20 Next Due Date: 3-Dec-20 Operator: SK Date: Equipment No.: A-01-04 TE 5170 Serial No. 10595 Model No.: **Ambient Condition** 301.3 758.4 Temperature, Ta (K) Pressure, Pa (mmHg) **Orifice Transfer Standard Information** Serial No. 3746 Slope, mc 0.0592 Intercept, bc -0.0274 mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ 17-Jan-20 Last Calibration Date: Qstd = $\{ [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} -bc \} / mc$ Next Calibration Date: 17-Jan-21 **Calibration of TSP Sampler** Orfice HVS Calibration ΔH (orifice), $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ 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 13.5 3.65 62.12 6.6 2.55 2 10.7 3.25 55.36 5.3 2.29 8.2 2.84 48.52 4.0 1.99 3 2.5 1.57 4 4.4 2.08 35.66 5 2.6 1.60 27.52 1.8 1.33 By Linear Regression of Y on X Slope, mw = 0.0353Intercept, bw : 0.3298 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; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.45 Remarks: 3 October 2020 Conducted by: SK Wong Signature: Date: Checked by: Henry Leung Signature: 3 October 2020 Date:

5-POINT CALIBRATION DATA SHEET

						File No.	MA20003/04/0003
Project No.	KER 1 - Future	Residential Deve	elopment at Kerry	Godown			
Date:	3-De	ec-20	Next Due Date:	3-I	Feb-21	Operator:	SK
Equipment No.:	A-02	1-04	Model No.:	TE	E 5170	Serial No.	10595
			A -11: -4 C	1*/*			
Temperatur	re Ta(K)	290.4	Ambient C Pressure, Pa			765.8	
Temperatur	ie, ia (K)	230.4	riessuie, ra	(mmig)		703.8	
		Ori	fice Transfer Star	dard Informa	ation		
Serial	No.	3746	Slope, mc	0.0592	Intercept	t, bc	-0.0274
Last Calibra	ation Date:	17-Jan-20	n	nc x Qstd + bo	$c = [\Delta H \times (Pa/760)]$) x (298/Ta)	$\left. \right ^{1/2}$
Next Calibra	ation Date:	17-Jan-21	($Qstd = \{ [\Delta H \ x] \}$	(Pa/760) x (298/7	Γa)] ^{1/2} -bc} /	mc
		0	Calibration of	ISP Sampler		HVC	
Calibration	ΔH (orifice),	1	fice	Qstd (CFM)	ΔW (HVS), in.	HVS in. [ΔW x (Pa/760) x (298/Ta	
Point	in. of water	[ΔH x (Pa/76	0) x $(298/Ta)$] ^{1/2}	X - axis	of water	[\(\triangle \) \(\triangle \) \(\triangle \)	Y-axis
1	13.3	3	3.71	63.10	6.5		2.59
2	10.8	3	3.34	56.91	5.2		2.32
3	8.3	2	2.93	49.95	4.0		2.03
4	4.5	2	2.16	36.90	2.6		1.64
5	2.5	1	1.61	27.62	1.8		1.36
By Linear Regr	ession of Y on X						
Slope, mw =		_		ntercept, bw =	0.391	6	
	coefficient* =		9963				
*If Correlation C	Coefficient < 0.99	00, check and rec	calibrate.				
			Set Point Ca	Jaulatian			
From the TSP Fi	ield Calibration (Surve take Ostd		ilculation			
	sion Equation, th						
rom me regres	eron Equation, u		-				
		mw x Q	$\mathbf{std} + \mathbf{bw} = [\Delta \mathbf{W} \ \mathbf{x}]$	(Pa/760) x (29	98/Ta)] ^{1/2}		
Therefore Se	ot Point: W = (m	w v Ootd ± hw)	² x (760 / Pa) x (7	Γο / 208) —	3.33		
Therefore, Se	et Follit, W – (III	w x Qsia + bw)	x (/00 / Fa) x (1	1 a / 290) –	3.33		
Remarks:							
			121				
Conducted by:	SK Wong	Signature:	19/C			Date:	03 December 2020
Checked by:	Henry Leung	Signature:	-lema X	~ <u></u>		Date:	03 December 2020

 $F: \c Note the Solutions \c Equipment \c Calibration Cert \c Note \c Note that \c Note \c No$

5-POINT CALIBRATION DATA SHEET

						File No.	MA20003/44/0004
•			Paediatrics (Childr	•			
Date:		c-20	Next Due Date:	3-l	Feb-21		SK
Equipment No.:	A-01	-44	Model No.:	TE	E-5170	Serial No.	1316
			Ambient C	ondition			
Temperatu	re, Ta (K)	290.4	Pressure, Pa	(mmHg)		765.8	
		Ori	fice Transfer Star	ndard Informa	ation		
Serial	No	3746	Slope, mc	0.0592	l	. he	-0.02740
Last Calibra		17-Jan-20	Slope, mc 0.0592 Intercept, bc				
					$(Pa/760) \times (298/7)$		
Next Calibra	ation Date:	17-Jan-21	<u> </u>	<u> </u>	(Fa//00) X (298/)	[a)] -bc}/	inc
		•	Calibration of	ΓSP Sampler			
Calibration		Or	fice			HVS	
Point	ΔH (orifice), in. of water	[ΔH x (Pa/76	(60) 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	12.9		3.65	62.16	8.7		3.00
2	10.4		3.28	55.86	6.6		2.61
3	7.9		2.86	48.74	4.9		2.25
4	5.9		2.47	42.18	3.4		1.87
5	3.1		1.79	30.71	1.8		1.36
Slope , mw = Correlation	ression of Y on X 0.0520 coefficient* =	0	.9982	Intercept, bw =	-0.269	9	-
*If Correlation (Coefficient < 0.99	0, check and re	calibrate.				
			Set Point Ca	lculation			
	ield Calibration C ssion Equation, th	e "Y" value acc		(Pa/760) x (29	98/Ta)] ^{1/2}		
Therefore, Se	et Point; W = (m	w x Qstd + bw)	² x (760 / Pa) x (7	Γa / 298) =	3.73		-
Remarks:							
Conducted by:	SK Wong	Signature:	<u> </u>			Date:	03 December 2020
Checked by:	Henry Leung	Signature:	-lema (Xon		Date:	03 December 2020

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5-POINT CALIBRATION DATA SHEET

File No. MA20003/41/0003 Project No. KTD 2c - G/IC Zone next to Kwun Tong Bypass (Next to the Kowloon Bay Sewage Interception Station) 3-Dec-20 3-Feb-21 Date: Next Due Date: SK Operator: TE 5170 Equipment No.: A-01-41 5280 Model No.: Serial No. **Ambient Condition** 290.4 Pressure, Pa (mmHg) 765.8 Temperature, Ta (K) **Orifice Transfer Standard Information** 3746 Slope, mc 0.0592 Intercept, bc -0.0274 Serial No. mc x Qstd + bc = $[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$ Last Calibration Date: 17-Jan-20 Qstd = $\{ [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} -bc \} / mc$ Next Calibration Date: 17-Jan-21 **Calibration of TSP Sampler** Orfice **HVS** Calibration $[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ ΔH (orifice), Qstd (CFM) ΔW (HVS), in. $[\Delta H \ x \ (Pa/760) \ x \ (298/Ta)]^{1/2}$ Point in. of water X - axis of water Y-axis 1 13.5 3.74 63.57 6.5 2.59 2 11.1 3.39 57.69 5.2 2.32 3 8.1 2.89 49.35 4.1 2.06 4 4.6 2.18 37.30 2.5 1.61 2.6 5 1.8 1.64 28.16 1.36 By Linear Regression of Y on X Slope, mw = 0.0346Intercept, bw : 0.3558 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 = $(mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ 3.28 Remarks: 03 December 2020 Conducted by: SK Wong Date: Signature:

03 December 2020

Date:

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RECALIBRATION **DUE DATE:**

January 17, 2021

ertificate o

Calibration Certification Information

Cal. Date: January 17, 2020

Rootsmeter S/N: 438320

Ta: 295 Pa: 744.2 °K

Operator: Jim Tisch

mm Hg

Calibration Model #: TE-5025A

Calibrator S/N: 3746

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4340	3.2	2.00
2	3	4	1	1.0180	6.4	4.00
3	5	6	1	0.9080	7.9	5.00
4	7	8	1	0.8700	8.7	5.50
5	9	10	1	0.7150	12.6	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)
0.9849	0.6868	1.4066	0.9957	0.6944	0.8904
0.9807	0.9633	1.9892	0.9914	0.9739	1.2592
0.9787	1.0779	2.2240	0.9894	1.0896	1.4078
0.9776	1.1237	2.3325	0.9883	1.1360	1.4765
0.9724	1.3601	2.8131	0.9831	1.3749	1.7808
	m=	2.09221		m=	1.31010
QSTD	b=	-0.02779	QA	b=	-0.01759
	r=	0.99994		r=	0.99994

	Calculations					
Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	Va=	ΔVol((Pa-ΔP)/Pa)			
Qstd=	Vstd/∆Time	Qa=	Va/∆Time			
	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: rootsme	ter manometer reading (mm Hg)				
Ta: actual ab	solute temperature (°K)				
Pa: actual barometric pressure (mm Hg)					
b: intercept					
m: clono					

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



Cerificate 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>21-Aug-2020</u>

Next Due Date <u>21-Feb-2021</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
2.2	2.3	-0.1
3.5	3.4	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:	I lema chang	
	Wong Shing Kwai	_	Henry Leung	