Appendix E

Copies of
Calibration
Certificates for Air
Quality
Monitoring and
Water Quality
Monitoring

 Location
 : ASR 5

 Calibrated by
 : K.T.Ho

 Date
 : 07/08/2020

Sampler

 Model
 :
 TE-5170

 Serial Number
 :
 S/N 0816

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454

Service Date : 18 February 2020

 Slope (m)
 : 2.07134

 Intercept (b)
 : -0.04091

 Correlation Coefficient(r)
 : 0.99999

Standard Condition

Pstd (hpa) : 1013 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1008 Ta(K) : 304

Resi	Resistance Plate dH [green liquid]		Z	X=Qstd	IC	Y
		(inch water)		(cubic meter/min)	(chart)	(corrected)
1	18 holes	12.2	3.450	1.685	55	54.32
2	13 holes	9.5	3.044	1.489	50	49.38
3	10 holes	7.1	2.632	1.290	43	42.47
4	7 holes	5.0	2.208	1.086	38	37.53
5	5 holes	2.6	1.593	0.789	30	29.63

Notes:Z=SQRT{dH(Pa/Pstd)(Tstd/Ta)}, X=Z/m-b, Y(Corrected Flow)=IC*{SQRT(Pa/Pstd)(Tstd/Ta)}

Sampler Calibration Relationship (Linear Regression)

 Location
 : ASR10

 Calibrated by
 : K.T.Ho

 Date
 : 07/08/2020

Sampler

Model : TE-5170 Serial Number : S/N 8162

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454

Service Date : 18 February 2020

 Slope (m)
 : 2.07134

 Intercept (b)
 : -0.04091

 Correlation Coefficient(r)
 : 0.99999

Standard Condition

Pstd (hpa) : 1013 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1008 Ta(K) : 304

Resi	Resistance Plate dH [green liquid]		Z	X=Qstd	IC	Y
		(inch water)		(cubic meter/min)	(chart)	(corrected)
1	18 holes	11.6	3.364	1.644	56	55.31
2	13 holes	9.0	2.963	1.450	50	49.38
3	10 holes	6.5	2.518	1.235	42	41.48
4	7 holes	4.2	2.024	0.997	35	34.57
5	5 holes	2.5	1.562	0.774	28	27.65

Notes:Z=SQRT{dH(Pa/Pstd)(Tstd/Ta)}, X=Z/m-b, Y(Corrected Flow)=IC*{SQRT(Pa/Pstd)(Tstd/Ta)}

Sampler Calibration Relationship (Linear Regression)

Slope(m):31.949 Intercept(b): 2.701 Correlation Coefficient(r): 0.9994

 Location
 : AQMS1

 Calibrated by
 : K.T.Ho

 Date
 : 07/08/2020

Sampler

 Model
 :
 TE-5170

 Serial Number
 :
 S/N 1253

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454

Service Date : 18 February 2020

 Slope (m)
 : 2.07134

 Intercept (b)
 : -0.04091

 Correlation Coefficient(r)
 : 0.99999

Standard Condition

Pstd (hpa) : 1013 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1008 Ta(K) : 304

Resi	Resistance Plate dH [green liquid]		Z	X=Qstd	IC	Y
		(inch water)		(cubic meter/min)	(chart)	(corrected)
1	18 holes	12.2	3.450	1.685	54	53.33
2	13 holes	9.1	2.979	1.458	48	47.41
3	10 holes	6.8	2.575	1.263	43	42.47
4	7 holes	4.6	2.118	1.042	37	36.54
5	5 holes	2.3	1.498	0.743	28	27.65

Notes:Z=SQRT{dH(Pa/Pstd)(Tstd/Ta)}, X=Z/m-b, Y(Corrected Flow)=IC*{SQRT(Pa/Pstd)(Tstd/Ta)}

Sampler Calibration Relationship (Linear Regression)

 Location
 : ASR 1

 Calibrated by
 : K.T.Ho

 Date
 : 07/08/2020

Sampler

Model : TE-5170 Serial Number : S/N 0146

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454

Service Date : 18 February 2020

 Slope (m)
 : 2.07134

 Intercept (b)
 : -0.04091

 Correlation Coefficient(r)
 : 0.99999

Standard Condition

Pstd (hpa) : 1013 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1008 Ta(K) : 304

Resi	Resistance Plate dH [green liquid]		Z	X=Qstd	IC	Y
		(inch water)		(cubic meter/min)	(chart)	(corrected)
1	18 holes	12.0	3.421	1.671	54	53.33
2	13 holes	9.2	2.996	1.466	49	48.39
3	10 holes	6.6	2.537	1.245	42	41.48
4	7 holes	4.2	2.024	0.997	36	35.55
5	5 holes	2.3	1.498	0.743	27	26.67

Notes:Z=SQRT{dH(Pa/Pstd)(Tstd/Ta)}, X=Z/m-b, Y(Corrected Flow)=IC*{SQRT(Pa/Pstd)(Tstd/Ta)}

Sampler Calibration Relationship (Linear Regression)

 Location
 : ASR 6

 Calibrated by
 : K.T.Ho

 Date
 : 07/08/2020

Sampler

 Model
 :
 TE-5170

 Serial Number
 :
 S/N 3957

Calibration Orifice and Standard Calibration Relationship

Serial Number : 2454

Service Date : 18 February 2020

 Slope (m)
 : 2.07134

 Intercept (b)
 : -0.04091

 Correlation Coefficient(r)
 : 0.99999

Standard Condition

Pstd (hpa) : 1013 Tstd (K) : 298.18

Calibration Condition

Pa (hpa) : 1008 Ta(K) : 304

Resi	Resistance Plate dH [green liquid]		Z	X=Qstd	IC	Y
		(inch water)		(cubic meter/min)	(chart)	(corrected)
1	18 holes	12.2	3.450	1.685	56	55.31
2	13 holes	9.4	3.028	1.482	50	49.38
3	10 holes	6.8	2.575	1.263	44	43.46
4	7 holes	4.6	2.118	1.042	38	37.53
5	5 holes	2.3	1.498	0.743	30	29.63

Notes:Z=SQRT{dH(Pa/Pstd)(Tstd/Ta)}, X=Z/m-b, Y(Corrected Flow)=IC*{SQRT(Pa/Pstd)(Tstd/Ta)}

Sampler Calibration Relationship (Linear Regression)

Slope(m):27.168 Intercept(b): 9.290 Correlation Coefficient(r): 0.9999



RECALIBRATION DUE DATE:

February 18, 2021

Certificate of Calibration

Calibration Certification Information

Cal. Date: February 18, 2020

Rootsmeter S/N: 438320

°K

Operator: Jim Tisch

Tisch

Ta: 294
Pa: 753.1

mm Hg

Calibration Model #: TE-5025A

Calibrator S/N: 2454

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4190	3.2	2.00
2	3	4	1	1.0100	6.4	4.00
3	5	6	1	0.9020	7.9	5.00
4	7	8	1	0.8600	8.8	5.50
5	9	10	1	0.7110	12.7	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)
1.0001	0.7048	1.4173	0.9958	0.7017	0.8836
0.9959	0.9860	2.0044	0.9915	0.9817	1.2496
0.9939	1.1019	2.2410	0.9895	1.0970	1.3971
0.9927	1.1543	2.3504	0.9883	1.1492	1.4653
0.9875	1.3889	2.8347	0.9831	1.3828	1.7672
	m=	2.07134		m=	1.29704
QSTD[b=	-0.04091	QA	b=	-0.02551
	r=	0.99999		r=	0.99999

Calculation	ns				
Vstd= ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	Va= ΔVol((Pa-ΔP)/Pa)				
Qstd= Vstd/ΔTime	Qa= Va/ΔTime				
For subsequent flow ra	te 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: rootsmete	er manometer reading (mm Hg)	
Ta: actual abs	olute temperature (°K)	
Pa: actual bar	ometric pressure (mm Hg)	
b: intercept	TV-MITATORY CONTRACTORY	
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

FAX: (513)467-9009



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration 校正證書

Certificate No.:

C203177

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號: IC20-1161)

Date of Receipt / 收件日期: 1 June 2020

Description / 儀器名稱

Anemometer

Manufacturer / 製造商

Lutron

Model No./型號

AM-4201

Serial No. / 編號

AF.27513

Supplied By / 委託者

Envirotech Services Co.

Room 113, 1/F, My Loft, 9 Hoi Wing Road, Tuen Mun,

New Territories, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 :

 $(23 \pm 2)^{\circ}$ C

Relative Humidity / 相對濕度 :

 $(50 \pm 25)\%$

Line Voltage / 電壓 :

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期

9 June 2020

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via:

- Testo Industrial Services GmbH, Germany

Tested By

測試

TF Lee

Assistant Engineer

Certified By

核證

Chan Un Cl

Engineer

1

Date of Issue

11 June 2020

or issue .

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。



輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No.: C203177

證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- 2. The results presented are the mean of 10 measurements at each calibration point.
- 3. Test equipment:

Equipment ID CL386

Description

Multi-function Measuring Instrument

Certificate No.

S16494

4. Test procedure: MA130N.

Results:

Air Velocity

Applied	UUT	Measured Correction		
Value	Reading	Value Measurement Uncertainty		ertainty
(m/s)	(m/s)	(m/s)	Expanded Uncertainty (m/s)	Coverage Factor
2.0	1.8	+0.2	0.2	2.0
4.0	3.8	+0.2	0.3	2.0
6.1	5.9	+0.2	0.3	2.0
8.1	8.0	+0.1	0.3	2.0
10.0	10.1	-0.1	0.4	2.0

Remarks: - The Measured Corrections are defined as:

Value = Applied Value - UUT Reading

- The expanded uncertainties are for a level of confidence of 95 %.

Note:

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration is traceable to the National Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory

本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

ENVIROTECH SERVICES CO.

Calibration Report of Wind Meter

Date of Calibration :	29 June 2020	
Brand of Test Meter:	Davis	
Model:	Vantage Pro 2 (s/n: AS160104014)	
Location:	Roof of Tuen Mun Firestation	
Procedures:		
1. Wind Still Test:	The wind speed sensor was hold by hand un	til it keep still
2.Wind Speed Test:	The wind meter was on-site calibrated again	st the Anemometer
3.Wind Direction Test:	The wind meter was on-site calibrated again	st the marine compass at four directions
Results:		
Wind Still Test		
	Wind Speed (m/s)	
	0.00	
Wind Speed Test		

Davis (m/s)	Anemometer (m/s)
4.4	4.8
3.2	2.9
1.8	1.9

Wind Direction Test

Davis (o)	Marine Compass (o)
270	270
0	0
91	90
181	180

Calibrated by: Checked by : Fact

Yeung Ping Fai

(Technical Officer) Checked by : Fact

Ho Kam Fat

(Senior Technical Officer)



REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

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AJ070066

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21 July 2020

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PART A - CUSTOMER INFORMATION

Enovative Environmental Service Ltd. Flat 2207, Yu Fun House, Yu Chui Court, Shatin New Territories, Hong Kong

Attn: Mr. Thomas WONG

PART B - DESCRIPTION

Name of Equipment

: YSI ProDSS (Multi-Parameters)

Manufacturer

YSI (a xylem brand)

Serial Number Date of Received 17E100747 Jul 20, 2020

Date of Calibration

Jul 20, 2020

Date of Next Calibration^(a)

Oct 19, 2020

PART C - REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

ParameterReference MethodpH at 25°CAPHA 21e 4500-H* BDissolved OxygenAPHA 21e 4500-O GConductivity at 25°CAPHA 21e 2510 BSalinityAPHA 21e 2520 B

Turbidity APHA 21e 2130 B

Temperature Section 6 of international Accreditation New Zealand Technical

Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D - CALIBRATION RESULTS(b,c)

(1) pH at 25°C

Target (pH unit)	Displayed Reading(d) (pH Unit)	Tolerance(e)(pH Unit)	Results
4.00	4.02	0.02	Satisfactory
7.42	7.44	0.02	Satisfactory
10.01	10.09	0.08	Satisfactory

Tolerance of pH should be less than ±0.20 (pH unit)

(2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
10	10.0	0.0	Satisfactory
28	27.5	-0.5	Satisfactory
48	49.0	1.0	Satisfactory

Tolerance limit of temperature should be less than ±2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

Remark(s): -

The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.

(b) The results relate only to the calibrated equipment as received

(c) The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

(d) "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.

The "Tolerance Limit" mentioned is referenced to YSI product specifications.

LEE Chun-ning, Desmond Senior Chemist



Tel: (852) 3956 8717; Fax: (852) 3956 3928

REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

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PART D - CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.10	0.29	0.19	Satisfactory
1.89	2.04	0.15	Satisfactory
4.51	4.22	-0.29	Satisfactory
6.90	7.10	0.20	Satisfactory

Tolerance limit of dissolved oxygen should be less than ±0.50 (mg/L)

(4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading (µS/cm)	Displayed Reading (μS/cm)	Tolerance (%)	Results
0.001	146.9	147.2	0.20	Satisfactory
0.01	1412	1462	3.54	Satisfactory
0.1	12890	12417	-3.67	Satisfactory
0.5	58670	57942	-1.24	Satisfactory
1.0	111900	111098	-0.72	Satisfactory

Tolerance limit of conductivity should be less than ±10.0 (%)

(5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.98	-0.20	Satisfactory
20	20.09	0.45	Satisfactory
30	30.31	1.03	Satisfactory

Tolerance limit of salinity should be less than ±10.0 (%)

(6) Turbidity

Expected Reading (NTU)	Displayed Reading ^(f) (NTU)	Tolerance ^(g) (%)	Results
0	0.21	==	Satisfactory
10	10.11	1.1	Satisfactory
20	20.22	1.1	Satisfactory
100	104.37	4.4	Satisfactory
800	793.41	-0.8	Satisfactory

Tolerance limit of turbidity should be less than ±10.0 (%)

~ END OF REPORT ~

Remark(s): -

O "Displayed Reading" presents the figures shown on item under calibration/checking regardless of equipment precision or significant figures.

⁽g) The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.



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AJ070067

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PART A - CUSTOMER INFORMATION

Enovative Environmental Service Ltd.

Flat 2207, Yu Fun House, Yu Chui Court, Shatin New Territories, Hong Kong

Attn: Mr. Thomas WONG

PART B - DESCRIPTION

Name of Equipment

YSI 6920V2 (Multi-Parameters)

Manufacturer

YSI (a xylem brand)

Serial Number

0001C6A7

Date of Received

Jul 20, 2020

Date of Calibration

Jul 20, 2020

Date of Next Calibration^(a)

Oct 19, 2020

PART C - REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

<u>Parameter</u>

Reference Method

pH at 25°C Dissolved Oxygen APHA 21e 4500-H⁺ B APHA 21e 4500-O G

Conductivity at 25°C

APHA 21e 2510 B

Salinity

APHA 21e 2520 B

Turbidity

APHA 21e 2130 B

Temperature

Section 6 of international Accreditation New Zealand Technical

Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D - CALIBRATION RESULTS(b,c)

(1) pH at 25°C

Target (pH unit)	Displayed Reading(d) (pH Unit)	Tolerance ^(e) (pH Unit)	Results
4.00	4.01	0.01	Satisfactory
7.42	7.44	0.02	Satisfactory
10.01	10.10	0.09	Satisfactory

Tolerance of pH should be less than ±0.20 (pH unit)

(2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
10	10.03	0.03	Satisfactory
28	28.06	0.06	Satisfactory
48	47.90	-0.10	Satisfactory

Tolerance limit of temperature should be less than ±2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

Remark(s): -

(a) The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.

(b) The results relate only to the calibrated equipment as received

(e) The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

(d) "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.

(e) The "Tolerance Limit" mentioned is referenced to YSI product specifications.

LEE Chun-ning, Desmond Senior Chemist



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PART D - CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
0.10	0.32	0.22	Satisfactory
1.89	2.02	0.13	Satisfactory
4.51	4.24	-0.27	Satisfactory
6.90	7.12	0.22	Satisfactory

Tolerance limit of dissolved oxygen should be less than ±0.50 (mg/L)

(4) Conductivity at 25°C

Conc. of KCl (M)	Expected Reading (µS/cm)	Displayed Reading (μS/cm)	Tolerance (%)	Results
0.001	146.9	147.9	0.68	Satisfactory
0.01	1412	1453	2.90	Satisfactory
0.1	12890	12360	-4.11	Satisfactory
0.5	58670	58122	-0.93	Satisfactory
1.0	111900	110812	-0.97	Satisfactory

Tolerance limit of conductivity should be less than ±10.0 (%)

(5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	10.01	0.10	Satisfactory
20	20.11	0.55	Satisfactory
30	30.28	0.93	Satisfactory

Tolerance limit of salinity should be less than ±10.0 (%)

(6) Turbidity

Expected Reading (NTU)	Displayed Reading ^(f) (NTU)	Tolerance ^(g) (%)	Results
0	0.18		Satisfactory
10	10.12	1.2	Satisfactory
20	20.19	1.0	Satisfactory
100	103.98	4.0	Satisfactory
800	795.11	-0.6	Satisfactory

Tolerance limit of turbidity should be less than ± 10.0 (%)

Remark(s): -

[~] END OF REPORT ~

^{(1) &}quot;Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

⁽⁸⁾ The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.