High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 5
Calibrated by	:	P.F.Yeung
Date	:	10/12/2014

Sampler

Model	:	TE-5170
Serial Number	:	S/N 0816

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	14 Mar 2014
Slope (m)	:	2.07593
Intercept (b)	:	-0.00102
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1019
Ta(K)	:	293

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.8	3.475	1.674	54	54.62
2	13 holes	9.4	3.101	1.494	47	47.54
3	10 holes	7.0	2.676	1.290	40	40.46
4	7 holes	4.8	2.216	1.068	32	32.37
5	5 holes	2.9	1.722	0.830	24	24.28

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):35.842 Intercept(b): -5.713 Correlation Coefficient(r): 0.9997

Checked by: Magnum Fan Date: 17/12/2014

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR10
Calibrated by	:	P.F.Yeung
Date	:	10/12/2014

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	14 Mar 2014
Slope (m)	:	2.07593
Intercept (b)	:	-0.00102
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1019
Ta(K)	:	293

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.6	3.590	1.730	62	62.71
2	13 holes	9.2	3.068	1.478	52	52.60
3	10 holes	7.0	2.676	1.290	45	45.52
4	7 holes	4.6	2.169	1.047	36	36.41
5	5 holes	2.8	1.693	0.816	28	28.32

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):37.576 Intercept(b): -2.680 Correlation Coefficient(r): 0.9997

Checked by: Magnum Fan Date: 17/12/14

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AQMS1
Calibrated by	:	P.F.Yeung
Date	:	10/12/2014

Sampler

Model	:	TE-5170
Serial Number	:	S/N 1253

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	14 Mar 2014
Slope (m)	:	2.07593
Intercept (b)	:	-0.00102
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1019
Ta(K)	:	293

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	13.0	3.647	1.757	56	56.64
2	13 holes	10.2	3.230	1.557	50	50.57
3	10 holes	7.8	2.825	1.361	45	45.52
4	7 holes	5.0	2.262	1.090	37	37.42
5	5 holes	3.0	1.752	0.844	31	31.36

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):27.785 Intercept(b): 7.574 Correlation Coefficient(r): 0.9995

Checked by: Magnum Fan Date: 17/12/2014

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 1
Calibrated by	:	P.F.Yeung
Date	:	10/12/2014

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	14 Mar 2014
Slope (m)	:	2.07593
Intercept (b)	:	-0.00102
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1019
Ta(K)	:	293

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.8	3.475	1.674	52	52.60
2	13 holes	9.6	3.134	1.510	47	47.54
3	10 holes	7.0	2.676	1.290	38	38.44
4	7 holes	4.6	2.169	1.046	30	30.34
5	5 holes	2.8	1.693	0.816	22	22.25

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):35.713 Intercept(b): -7.017 Correlation Coefficient(r): 0.9994

Checked by: Magnum Fan Date: 17/12/2014

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 6
Calibrated by	:	P.F.Yeung
Date	:	10/12/2014

Sampler

Model	:	TE-5170
Serial Number	:	S/N 3957

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	14 Mar 2014
Slope (m)	:	2.05818
Intercept (b)	:	0.01929
Correlation Coefficient(r)	:	0.99991

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1019
Ta(K)	:	293

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.6	3.590	1.730	53	53.61
2	13 holes	9.6	3.134	1.510	46	46.53
3	10 holes	7.2	2.714	1.308	39	39.45
4	7 holes	4.4	2.122	1.023	31	31.36
5	5 holes	3.0	1.752	0.844	25	25.29

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):31.736 Intercept(b): -1.473 Correlation Coefficient(r): 0.9995

Checked by: Magnum Fan Date: 17/12/2014

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 5
Calibrated by	:	P.F.Yeung
Date	:	10/02/2015

Sampler

Model	:	TE-5170
Serial Number	:	S/N 0816

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	14 Mar 2014
Slope (m)	:	2.07593
Intercept (b)	:	-0.00102
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1022
Ta(K)	:	288

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.5	3.612	1.741	57	58.24
2	13 holes	9.5	3.149	1.517	50	51.09
3	10 holes	7.4	2.779	1.339	44	44.96
4	7 holes	4.8	2.238	1.079	35	35.76
5	5 holes	2.8	1.710	0.824	28	28.61

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):32.792 Intercept(b): 1.098 Correlation Coefficient(r): 0.9993

Checked by: Magnum Fan Date: 16/02/2015

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR10
Calibrated by	:	P.F.Yeung
Date	:	10/02/2015

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	14 Mar 2014
Slope (m)	:	2.07593
Intercept (b)	:	-0.00102
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1022
Ta(K)	:	288

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.6	3.590	1.730	62	62.71
2	13 holes	9.2	3.068	1.478	52	52.60
3	10 holes	7.0	2.676	1.290	45	45.52
4	7 holes	4.6	2.169	1.047	36	36.41
5	5 holes	2.8	1.693	0.816	28	28.32

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):37.576 Intercept(b): -2.680 Correlation Coefficient(r): 0.9997

Checked by: Magnum Fan Date: 16/02/15

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	AQMS1
Calibrated by	:	P.F.Yeung
Date	:	10/02/2015

Sampler

Model	:	TE-5170
Serial Number	:	S/N 1253

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	14 Mar 2014
Slope (m)	:	2.07593
Intercept (b)	:	-0.00102
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1022
Ta(K)	:	288

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.6	3.627	1.748	54	55.17
2	13 holes	9.8	3.198	1.541	48	49.04
3	10 holes	7.5	2.798	1.348	42	42.91
4	7 holes	5.0	2.285	1.101	36	36.78
5	5 holes	2.9	1.740	0.839	29	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):27.982 Intercept(b): 5.901 Correlation Coefficient(r): 0.9995

Checked by: Magnum Fan Date: 16/02/2015

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 1
Calibrated by	:	P.F.Yeung
Date	:	10/02/2015

Sampler

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

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	14 Mar 2014
Slope (m)	:	2.07593
Intercept (b)	:	-0.00102
Correlation Coefficient(r)	:	0.99996

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1022
Ta(K)	:	288

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	11.9	3.525	1.698	53	54.15
2	13 holes	9.5	3.149	1.517	47	48.02
3	10 holes	7.0	2.703	1.303	40	40.87
4	7 holes	4.7	2.215	1.068	32	32.70
5	5 holes	2.8	1.710	0.824	24	24.52

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):33.930 Intercept(b): -3.447 Correlation Coefficient(r): 0.9993

Checked by: Magnum Fan Date: 16/02/2015

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	ASR 6
Calibrated by	:	P.F.Yeung
Date	:	10/02/2015

Sampler

Model	:	TE-5170
Serial Number	:	S/N 3957

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	2454
Service Date	:	14 Mar 2014
Slope (m)	:	2.05818
Intercept (b)	:	0.01929
Correlation Coefficient(r)	:	0.99991

Standard Condition

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

Calibration Condition

Pa (hpa)	:	1022
Ta(K)	:	288

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (chart)	Y (corrected)
1	18 holes	12.8	3.655	1.761	54	55.17
2	13 holes	9.8	3.198	1.541	48	49.04
3	10 holes	7.2	2.742	1.321	41	41.89
4	7 holes	4.5	2.167	1.045	33	33.72
5	5 holes	2.9	1.740	0.839	27	27.59

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):30.101 Intercept(b): 2.309 Correlation Coefficient(r): 0.9995

Checked by: Magnum Fan Date: 16/02/2015

ENVIROTECH SERVICES CO.

Calibration Report of Wind Meter

Date of Calibration : 29 December 2014

Brand of Test Meter: Davis

Model: Weather Wizard III (s/n: WE90911A30)

Location : ASR5

Procedures :

1. Wind Still Test: The wind speed sensor was hold by hand until it keep still

2.Wind Speed Test: The wind meter was on-site calibrated against the Anemometer

3.Wind Direction Test : The wind meter was on-site calibrated against the marine compass at four directions

Results:

Wind Still Test

Wind Speed (m/s)
0.00

Wind Speed Test

Davis (m/s)	Anemomete (m/s)
1.4	1.6
1.9	1.7
2.4	2.5

Wind Direction Test

Davis (o)	Marine Compass (o)
271	270
0	0
91	90
179	180

Calibrated by: Fai

Yeung Ping Fai
(Technical Officer)

Checked by : Fat

Ho Kam Fat
(Senior Technical Officer)

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C146966
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC14-2877) Date of Receipt / 收件日期 : 12 November 2014

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. Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 14 November 2014

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 : C F Leung
Project Engineer

Certified By 核證 : H C Chan
Engineer

Date of Issue 簽發日期 : 18 November 2014

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C146966
證書編號

1. 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	Description	Certificate No.
CL386	Multi-function Measuring Instrument	S12109

4. Test procedure : MA130N.

5. Results :

Air Velocity

Applied Value (m/s)	UUT Reading (m/s)	Measured Correction		
		Value (m/s)	Measurement Uncertainty	
			Expanded Uncertainty (m/s)	Coverage Factor
2.0	1.7	+0.3	0.2	2.0
4.1	3.8	+0.3	0.3	2.0
6.1	5.8	+0.3	0.3	2.0
8.0	7.8	+0.2	0.3	2.0
10.0	9.9	+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 :
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.

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VILLAGE OF CLEVES, OH
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ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Mar 24, 2014 Rootsmeter S/N 0438320 Ta (K) - 293
Operator Tisch Orifice I.D. - 2454 Pa (mm) - 758.19

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4740	3.2	2.00
2	NA	NA	1.00	1.0340	6.4	4.00
3	NA	NA	1.00	0.9240	7.9	5.00
4	NA	NA	1.00	0.8820	8.8	5.50
5	NA	NA	1.00	0.7270	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)
1.0103	0.6854	1.4245
1.0061	0.9730	2.0146
1.0040	1.0866	2.2524
1.0028	1.1370	2.3623
0.9976	1.3722	2.8491

Qstd slope (m) = 2.07593
intercept (b) = -0.00102
coefficient (r) = 0.99996

y axis = SQRT[H2O(Pa/760)(298/Ta)]

Va	(x axis) Qa	(y axis)
0.9958	0.6755	0.8791
0.9916	0.9590	1.2433
0.9895	1.0709	1.3900
0.9884	1.1206	1.4579
0.9832	1.3524	1.7583

Qa slope (m) = 1.29991
intercept (b) = -0.00063
coefficient (r) = 0.99996

y axis = SQRT[H2O(Ta/Pa)]

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Performance Check of Turbidity Meter

Equipment Ref. No. : ET/0505/011 Manufacturer : HACH

Model No. : 2100Q Serial No. : 12060 C 018534

Date of Calibration : 05/01/2015 Due Date : 04/04/2015

Ref. No. of Turbidity Standard used (4000NTU)	005/6.1/001/7

Theoretical Value of Turbidity Standard (NTU)	Measured Value (NTU)	Difference % *
20	19.8	-1.00
100	104	4.00
800	788	-1.50

(*) Difference = (Measured Value – Theoretical Value) / Theoretical Value x 100

Acceptance Criteria

Difference : -5 % to 5 %

The turbidity meter complies * / ~~does not comply~~ * with the specified requirements and is deemed acceptable * / ~~unacceptable~~ * for use. Measurements are traceable to national standards.

Prepared by : _____ Checked by : _____

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Internal Calibration Report of Dissolved Oxygen Meter

Equipment Ref. No.	:	ET/EW/008/006	Manufacturer	:	YSI
Model No.	:	Pro 2030	Serial No.	:	12A 100554
Date of Calibration	:	17/12/2014	Calibration Due Date	:	16/03/2015

Temperature Verification

Ref. No. of Reference Thermometer : ET/0521/008

Ref. No. of Water Bath : ---

	Temperature (°C)			
Reference Thermometer reading	Measured	20.0	Corrected	19.4
DO Meter reading	Measured	19.4	Difference	0.0

Standardization of sodium thiosulphate ($Na_2S_2O_3$) solution

Reagent No. of $Na_2S_2O_3$ titrant	CPE/012/4.5/001/9	Reagent No. of 0.025N $K_2Cr_2O_7$	CPE/012/4.4/001/32

	Trial 1	Trial 2
Initial Vol. of $Na_2S_2O_3$ (ml)	0.00	10.15
Final Vol. of $Na_2S_2O_3$ (ml)	10.15	20.35
Vol. of $Na_2S_2O_3$ used (ml)	10.15	10.20
Normality of $Na_2S_2O_3$ solution (N)	0.02463	0.02451
Average Normality (**N**) of $Na_2S_2O_3$ solution (N)	0.02457	
Acceptance criteria, Deviation	Less than ± 0.001N	

Calculation: Normality of $Na_2S_2O_3$, **N** = 0.25 / ml $Na_2S_2O_3$ used

Lineality Checking

Determination of dissolved oxygen content by Winkler Titration *

Purging Time (min)	2		5		10	
Trial	1	2	1	2	1	2
Initial Vol. of $Na_2S_2O_3$ (ml)	0.00	11.40	22.80	0.00	6.60	10.30
Final Vol. of $Na_2S_2O_3$ (ml)	11.40	22.80	29.30	6.60	10.30	14.00
Vol. (**V**) of $Na_2S_2O_3$ used (ml)	11.40	11.40	6.50	6.60	3.70	3.70
Dissolved Oxygen (**DO**), mg/L	7.52	7.52	4.29	4.35	2.44	2.44
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation: DO (mg/L) = **V** x **N** x 8000/298

Purging time, min	DO meter reading, mg/L			Winkler Titration result *, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
2	7.61	7.20	7.41	7.52	7.52	7.52	1.47
5	4.28	4.75	4.52	4.29	4.35	4.32	4.52
10	2.50	2.49	2.50	2.44	2.44	2.44	2.43
Linear regression coefficient				0.9978			

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Internal Calibration Report of Dissolved Oxygen Meter

Zero Point Checking

DO meter reading, mg/L	0.00

Salinity Checking

Reagent No. of NaCl (10ppt)	CPE/012/4.7/002/29	Reagent No. of NaCl (30ppt)	CPE/012/4.8/002/29

Determination of dissolved oxygen content by Winkler Titration **

Salinity (ppt)	10		30	
Trial	1	2	1	2
Initial Vol. of $Na_2S_2O_3$ (ml)	0.00	11.90	23.80	34.40
Final Vol. of $Na_2S_2O_3$ (ml)	11.90	23.80	34.40	44.90
Vol. (**V**) of $Na_2S_2O_3$ used (ml)	11.90	11.90	10.60	10.50
Dissolved Oxygen (**DO**), mg/L	7.85	7.85	6.99	6.93
Acceptance criteria, Deviation	Less than + 0.3mg/L		Less than + 0.3mg/L	

Calculation: DO (mg/L) = **V** x **N** x 8000/298

Salinity (ppt)	DO meter reading, mg/L			Winkler Titration result**, mg/L			Difference (%) of DO Content
	1	2	Average	1	2	Average	
10	7.68	7.78	7.73	7.85	7.85	7.85	1.54
30	6.88	6.89	6.89	6.99	6.93	6.96	1.01

Acceptance Criteria

(1) Differenc between temperature readings from temperature sensor of DO probe and reference thermometer : < 0.5 °C
(2) Linear regression coefficient : >0.99
(3) Zero checking: 0.0mg/L
(4) Difference (%) of DO content from the meter reading and by winkler titration : within ± 5%

The equipment complies # / ~~does not comply~~ # with the specified requirements and is deemed acceptable # / ~~unacceptable~~ # for use.

Delete as appropriate

Calibrated by : _____ Approved by : _____

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Performance Check of Salinity Meter

Equipment Ref. No. : ET/EW/008/006 Manufacturer : YSI

Model No. : Pro 2030 Serial No. : 12A 100554

Date of Calibration : 17/12/2014 Due Date : 16/03/2015

Ref. No. of Salinity Standard used (30ppt)	S/001/5

Salinity Standard (ppt)	Measured Salinity (ppt)	Difference %
30.0	30.5	1.7

(*) Difference (%) = (Measured Salinity – Salinity Standard value) / Salinity Standard value x 100

Acceptance Criteria

Difference : -10 % to 10 %

The salinity meter complies * / ~~does not comply~~ * with the specified requirements and is deemed acceptable * / ~~unacceptable~~ * for use. Measurements are traceable to national standards.

Checked by : _____ Approved by : _____

東業德勤測試顧問有限公司
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Internal Calibration & Performance Check of pH Meter

Equipment Ref. No. :	ET/EW/007/005	Manufacturer :	HANNA
Model No. :	HI 8314	Serial No. :	8246095
Date of Calibration :	07/01/2015	Calibration Due Date :	06/02/2015

Liquid Junction Error

Primary Standard Solution Used : Phosphate Ref No. of Primary Solution: 003/5.2/001/20

Temperature of Solution : 20.0 $\Delta pH_{½}$ = +0.08

pH value of diluted buffer : 6.79 pH (S) = 6.881

ΔpH = pH(S) - pH of diluted buffer = 0.091 (Observed Deviation)

Liquid Junction Error (ΔpH_j) = ΔpH - $\Delta pH_{½}$ = 0.011

Shift on Stirring

pH of buffer solution (with stirring), pH_s = 6.91

Shift on stirring, ΔpH_s= pH_s - pH(S) - ΔpH_j = 0.018

Noise

Noise, ΔpH_n = difference between max and min reading : 0.00

Verification of ATC

Ref. No. of reference thermometer used: ET/0521/008

Temperature record from the reference thermometer (T_R): 19.9 °C

Temperature record from the ATC (T_{ATC}): 19.9 °C

Temperature Difference, $|T_R - T_{ATC}|$ 0.0 °C

Acceptance Criteria

Performance Characteristic		Acceptable Range
Liquid Junction Error	ΔpHj	≤0.05
Shift on Stirring	ΔpHs	≤0.02
Noise	ΔpHn	≤0.02
Verifcation of ATC	Temperature Difference	≤0.5°C

The pH meter complies * / ~~does not comply~~ * with the specified requirements and is deemed acceptable * / ~~unacceptable~~ * for use. Measurements are traceable to national standards.

* Delete as appropriate

Calibrated by : [signature] Checked by : [signature]

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Internal Calibration & Performance Check of pH Meter

Equipment Ref. No. :	ET/EW/007/005	Manufacturer :	HANNA
Model No. :	HI 8314	Serial No. :	8246095
Date of Calibration :	07/02/2015	Calibration Due Date :	06/03/2015

Liquid Junction Error

Primary Standard Solution Used : Phosphate — Ref No. of Primary Solution: 003/5.2/001/21

Temperature of Solution : 20.0 — $\Delta pH_{½}$ = +0.08

pH value of diluted buffer : 6.79 — pH (S) = 6.881

ΔpH = pH(S) - pH of diluted buffer = 0.091 (Observed Deviation)

Liquid Junction Error (ΔpH_j) = ΔpH - $\Delta pH_{½}$ = 0.011

Shift on Stirring

pH of buffer solution (with stirring), pH_s = 6.90

Shift on stirring, ΔpH_s= pH_s - pH(S) - ΔpH_j = 0.008

Noise

Noise, ΔpH_n = difference between max and min reading : 0.00

Verification of ATC

Ref. No. of reference thermometer used: ET/0521/008

Temperature record from the reference thermometer (T_R): 19.9 °C

Temperature record from the ATC (T_{ATC}): 20.0 °C

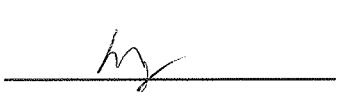
Temperature Difference, $|T_R - T_{ATC}|$ -0.1 °C

Acceptance Criteria

Performance Characteristic		Acceptable Range
Liquid Junction Error	ΔpHj	≤0.05
Shift on Stirring	ΔpHs	≤0.02
Noise	ΔpHn	≤0.02
Verifcation of ATC	Temperature Difference	≤0.5°C

The pH meter complies * / ~~does not comply~~ * with the specified requirements and is deemed acceptable * / ~~unacceptable~~ * for use. Measurements are traceable to national standards.

* Delete as appropriate

Calibrated by : 

Checked by :