

## **Appendix D. Calibration Certificates**





輝創工程有限公司

Sun Creation Engineering Limited

Calibration & Testing Laboratory

# Certificate of Calibration

## 校正證書

Certificate No. : C233445

證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC23-1050)

Date of Receipt / 收件日期 : 31 May 2023

Description / 儀器名稱 : Acoustic Calibrator

Manufacturer / 製造商 : Casella

Model No. / 型號 : CEL-120/1

Serial No. / 編號 : 2383737

Supplied By / 委託者 : Mott MacDonald Hong Kong Limited  
3/F., Manulife Place, 348 Kwun Tong Road, Kwun Tong,  
Kowloon, Hong Kong

### TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C

Relative Humidity / 相對濕度 : (50 ± 25)%

Line Voltage / 電壓 : ---

### TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 18 June 2023

### TEST RESULTS / 測試結果

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

The results do not exceed specified limits.

These limits refer to manufacturer's published tolerances as requested by the customer.

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

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

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Hottinger Brüel & Kjær Calibration Laboratory, Denmark
- Agilent Technologies / Keysight Technologies
- Fluke Everett Service Center, USA

Tested By

測試



K C Lee  
Engineer

Certified By

核證



H C Chan  
Engineer

Date of Issue

簽發日期

19 June 2023

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室書面批准。

Sun Creation Engineering Limited - Calibration & Testing Laboratory  
c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

Tel/電話: (852) 2927 2606

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Website/網址: www.suncreation.com



# Certificate of Calibration

## 校正證書

Certificate No. : C233445

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.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C223647
CL281	Multifunction Acoustic Calibrator	CDK2302738
TST150A	Measuring Amplifier	C221750

- Test procedure : MA100N.

- Results :

### 5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Limit (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.05	± 0.25	± 0.20
114 dB, 1 kHz	114.10		

### 5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Limit	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 5 Hz	± 0.1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :

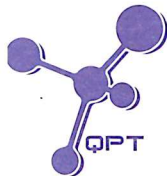
Only the original copy or the laboratory's certified true copy is valid.

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室所書面批准。





專業化驗有限公司  
QUALITY PRO TEST-CONSULT LIMITED

Unit 10, 5/F, Wah Wai Centre, 38-40 Au Pui Wan St., Fotan, Hong Kong  
Email: info@qualityprotest.com; Website: www.qualityprotest.com  
Tel: (852) 3956 8717; Fax: (852) 3956 3928

## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Test Report No. : R-BC060095  
Date of Issue : 27 June 2023  
Page No. : 1 of 2

### PART A - CUSTOMER INFORMATION

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

### PART B - SAMPLE INFORMATION

Name of Equipment : YSI ProDSS (Multi-Parameters)  
Manufacturer : YSI (a xylem brand)  
Serial Number : 17E100747  
Date of Received : 23 June 2023  
Date of Calibration : 23 June 2023  
Date of Next Calibration : 22 September 2023  
Request No. : D-BC060095

### PART C - REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Test Parameter	Reference Method
pH value	APHA 21e 4500 H <sup>+</sup>
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure
Salinity	APHA 21e 2520 B
Dissolved oxygen	APHA 21e 4500 O
Turbidity	APHA 21e 2130 B
Conductivity	APHA 21e 2510 B

### PART D - CALIBRATION RESULT

#### (1) pH value

Target (pH unit)	Display Reading (pH unit)	Tolerance	Result
4.00	4.09	0.09	Satisfactory
7.42	7.51	0.09	Satisfactory
10.01	9.93	-0.08	Satisfactory

Tolerance of pH value should be less than  $\pm 0.2$  (pH unit)

#### (2) Temperature

Reading of Ref. thermometer (°C)	Display Reading (°C)	Tolerance	Result
10	10.0	0.0	Satisfactory
25	25.0	0.0	Satisfactory
45	45.1	0.1	Satisfactory

Tolerance of Temperature should be less than  $\pm 2.0$  (°C)


#### (3) Salinity

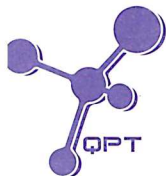
Expected Reading (g/L)	Display Reading (g/L)	Tolerance (%)	Result
10	10.20	2.00	Satisfactory
20	20.37	1.85	Satisfactory
30	30.19	0.63	Satisfactory

Tolerance of Salinity should be less than  $\pm 10.0$  (%)

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AUTHORIZED  
SIGNATORY:

  
LEE Chun-ning  
Assistant Manager (Chemical Testing)

**REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION**

Test Report No. : R-BC060095

Date of Issue : 27 June 2023

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**(4) Dissolved oxygen**

Expected Reading ( mg/L )	Display Reading ( mg/L )	Tolerance	Result
7.29	7.44	0.15	Satisfactory
6.12	5.94	-0.18	Satisfactory
5.48	5.75	0.27	Satisfactory
2.72	2.40	-0.32	Satisfactory

Tolerance of Dissolved oxygen should be less than  $\pm 0.5$  ( mg/L )**(5) Turbidity**

Expected Reading ( NTU )	Display Reading ( NTU )	Tolerance ( % )	Result
0	0.10	--	Satisfactory
10	10.18	1.80	Satisfactory
20	19.89	-0.50	Satisfactory
100	96.82	-3.20	Satisfactory
800	782.43	-2.20	Satisfactory

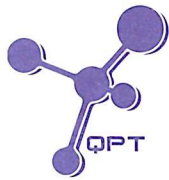
Tolerance of Turbidity should be less than  $\pm 10.0$  ( % )**(6) Conductivity**

Expected Reading ( $\mu\text{S/cm}$ at 25°C )	Display Reading	Tolerance ( % )	Result
146.9	150.1	2.18	Satisfactory
1412	1346	-4.67	Satisfactory
12890	13216	2.53	Satisfactory
58670	59463	1.35	Satisfactory
111900	112485	0.52	Satisfactory

Tolerance of Conductivity should be less than  $\pm 10.0$  ( % )**Remark(s)**

- The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted from relevant international standards.
- The results relate only to the calibrated equipment as received
- The performance of the equipment stated is checked with independent reference material and results compared against a calibrated secondary source.
- "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.
- The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted from relevant international standards.

--- END OF REPORT ---



專業化驗有限公司  
QUALITY PRO TEST-CONSULT LIMITED

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## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Test Report No. : R-BC060094  
Date of Issue : 27 June 2023  
Page No. : 1 of 2

### PART A - CUSTOMER INFORMATION

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

### PART B - SAMPLE INFORMATION

Name of Equipment : YSI ProDSS (Multi-Parameters)  
Manufacturer : YSI (a xylem brand)  
Serial Number : 15M100005  
Date of Received : 23 June 2023  
Date of Calibration : 23 June 2023  
Date of Next Calibration : 22 September 2023  
Request No. : D-BC060094

### PART C - REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Test Parameter	Reference Method
pH value	APHA 21e 4500 H <sup>+</sup>
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure
Salinity	APHA 21e 2520 B
Dissolved oxygen	APHA 21e 4500 O
Turbidity	APHA 21e 2130 B
Conductivity	APHA 21e 2510 B

### PART D - CALIBRATION RESULT

#### (1) pH value

Target (pH unit)	Display Reading (pH unit)	Tolerance	Result
4.00	4.04	0.04	Satisfactory
7.42	7.50	0.08	Satisfactory
10.01	9.98	-0.03	Satisfactory

Tolerance of pH value should be less than  $\pm 0.2$  (pH unit)

#### (2) Temperature

Reading of Ref. thermometer (°C)	Display Reading (°C)	Tolerance	Result
10	10.0	0.0	Satisfactory
25	24.9	-0.1	Satisfactory
45	45.1	0.1	Satisfactory

Tolerance of Temperature should be less than  $\pm 2.0$  (°C)

#### (3) Salinity

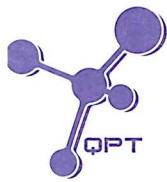
Expected Reading (g/L)	Display Reading (g/L)	Tolerance (%)	Result
10	10.18	1.80	Satisfactory
20	20.42	2.10	Satisfactory
30	30.20	0.67	Satisfactory

Tolerance of Salinity should be less than  $\pm 10.0$  (%)

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AUTHORIZED  
SIGNATORY:

LEE Chun-ting  
Assistant Manager (Chemical Testing)



## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Test Report No. : R-BC060094  
Date of Issue : 27 June 2023  
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### (4) Dissolved oxygen

Expected Reading ( mg/L )	Display Reading ( mg/L )	Tolerance	Result
7.29	7.41	0.12	Satisfactory
6.12	6.02	-0.10	Satisfactory
5.48	5.71	0.23	Satisfactory
2.72	2.38	-0.34	Satisfactory

Tolerance of Dissolved oxygen should be less than  $\pm 0.5$  ( mg/L )

### (5) Turbidity

Expected Reading ( NTU )	Display Reading ( NTU )	Tolerance ( % )	Result
0	0.10	--	Satisfactory
10	9.88	-1.20	Satisfactory
20	20.21	1.10	Satisfactory
100	97.34	-2.70	Satisfactory
800	781.97	-2.30	Satisfactory

Tolerance of Turbidity should be less than  $\pm 10.0$  ( % )

### (6) Conductivity

Expected Reading ( $\mu\text{S}/\text{cm}$ at 25°C )	Display Reading	Tolerance ( % )	Result
146.9	151.4	3.06	Satisfactory
1412	1288	-8.78	Satisfactory
12890	12793	-0.75	Satisfactory
58670	59287	1.05	Satisfactory
111900	112186	0.26	Satisfactory

Tolerance of Conductivity should be less than  $\pm 10.0$  ( % )

### Remark(s)

- The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted from relevant international standards.
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- The performance of the equipment stated is checked with independent reference material and results compared against a calibrated secondary source.
- "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.
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