# **Appendix E. Calibration Certificates**



## **QUALITY PRO TEST-CONSULT LIMITED**

Unit 10, 14/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

Report No.

AJ030054

Date of Issue

12 March 2020

Page No.

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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

17E100747

Date of Received

Mar 11, 2020

Date of Calibration

Mar 11, 2020

Date of Next Calibration<sup>(a)</sup>

Jun 10, 2020

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

**Parameter** 

Reference Method

pH at 25°C

APHA 21e 4500-H<sup>+</sup> B APHA 21e 4500-O G

Dissolved Oxygen 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 <sup>(e)</sup> (pH Unit)	Results
4.00	4.04	0.04	Satisfactory
7.42	7.38	-0.04	Satisfactory
10.01	10.04	0.03	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
10.0	10.2	0.2	Satisfactory
26.0	26.6	0.6	Satisfactory
47.0	47.4	0.4	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.



## QUALITY PRO TEST-CONSULT LIMITED

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# 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
0.38	0.48	0.10	Satisfactory
4.44	4.50	0.06	Satisfactory
6.78	6.68	-0.10	Satisfactory
8.54	8.62	0.08	Satisfactory

Tolerance limit of dissolved oxygen should be less than  $\pm 0.50$  (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	148.2	0.88	Satisfactory
0.01	1412	1386	-1.84	Satisfactory
0.1	12890	12436	-3.52	Satisfactory
0.5	58670	57314	-2.31	Satisfactory
1.0	111900	111048	-0.76	Satisfactory

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

#### (5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.99	-0.10	Satisfactory
20	20.16	0.80	Satisfactory
30	30.28	0.93	Satisfactory

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

#### (6) Turbidity

Expected Reading (NTU)	Displayed Reading <sup>(f)</sup> (NTU)	Tolerance <sup>(g)</sup> (%)	Results
0	0.06		Satisfactory
10	10.34	3.4	Satisfactory
20	20.32	1.6	Satisfactory
100	92.4	-7.6	Satisfactory
800	801.6	0.2	Satisfactory

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

~ END OF REPORT ~

Remark(s): -

<sup>&</sup>quot;Displayed Reading" presents the figures 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 form relevant international standards.



#### **OUALITY PRO TEST-CONSULT LIMITED**

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# REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No.

AJ030056

Date of Issue

12 March 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

18A104824

Date of Received

Mar 11, 2020

Date of Calibration

Mar 11, 2020

Date of Next Calibration(a)

Jun 10, 2020

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

**Parameter** 

Reference Method

pH at 25°C

APHA 21e 4500-H+ B

Dissolved Oxygen

APHA 21e 4500-O G APHA 21e 2510 B

Conductivity at 25°C

APHA 21e 2520 B

Salinity

APHA 21e 2130 B

Turbidity 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 <sup>(e)</sup> (pH Unit)	Results
4.00	4.06	0.06	Satisfactory
7,42	7.40	-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	Displayed Reading (°C)	Tolerance (°C)	Results
10.0	10.5	0.5	Satisfactory
26.0	26.1	0.1	Satisfactory
47.0	46.2	-0.8	Satisfactory

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

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Remark(s): -

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

The results relate only to the calibrated equipment as received

The performance of the equipment stated in this report 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 referenced to YSI product specifications.



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# 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
0.38	0.42	0.04	Satisfactory
4.44	4.51	0.07	Satisfactory
6.78	6.78	0.00	Satisfactory
8.54	8.72	0.18	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	145.8	-0.75	Satisfactory
0.01	1412	1356	-3.97	Satisfactory
0.1	12890	12176	-5.54	Satisfactory
0.5	58670	56438	-3.80	Satisfactory
1.0	111900	110819	-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	10.00	0.00	Satisfactory
20	20.54	2.70	Satisfactory
30	30.72	2.40	Satisfactory

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

#### (6) Turbidity

Expected Reading (NTU)	Displayed Reading <sup>(f)</sup> (NTU)	Tolerance <sup>(g)</sup> (%)	Results
0	0.02		Satisfactory
10	10.36	3.6	Satisfactory
20	20.82	4.1	Satisfactory
100	106.4	6.4	Satisfactory
800	812.4	1.6	Satisfactory

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

~ END OF REPORT ~

<sup>&</sup>quot;Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

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#### QUALITY PRO TEST-CONSULT LIMITED

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# REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No.

AJ030055

Date of Issue

12 March 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

16H104234

Date of Received

Mar 11, 2020

Date of Calibration

Mar 11, 2020

Date of Next Calibration<sup>(a)</sup>

Jun 10, 2020

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

**Parameter** 

Reference Method

pH at 25°C

APHA 21e 4500-H<sup>+</sup> B APHA 21e 4500-O G

Dissolved Oxygen 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	4.02	0.02	Satisfactory
7.42	7.44	0.02	Satisfactory
10.01	10.02	0.01	Satisfactory

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

#### (2) Temperature

Reading of Ref. thermometer	Displayed Reading (°C)	Tolerance (°C)	Results
10.0	10.4	0.4	Satisfactory
26.0	26.0	0.0	Satisfactory
47.0	47.4	0.4	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

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.



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# REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

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AJ030055

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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
0.38	0.39	0.01	Satisfactory
4.44	4.53	0.09	Satisfactory
6.78	6.70	-0.08	Satisfactory
8.54	8.74	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	151.0	2.79	Satisfactory
0.01	1412	1357	-3.90	Satisfactory
0.1	12890	11982	-7.04	Satisfactory
0.5	58670	56432	-3.81	Satisfactory
1.0	111900	110782	-1.00	Satisfactory

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

#### (5) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	10.00	0.00	Satisfactory
20	20.36	1.80	Satisfactory
30	30.56	1.87	Satisfactory

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

#### (6) Turbidity

Expected Reading (NTU)	Displayed Reading(f) (NTU)	Tolerance <sup>(g)</sup> (%)	Results
0	0.00		Satisfactory
10	10.24	2.4	Satisfactory
20	21.20	6.0	Satisfactory
100	94.6	-5.4	Satisfactory
800	792.4	-1.0	Satisfactory

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

~ END OF REPORT ~

<sup>&</sup>quot;Displayed Reading" presents the figures 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 form relevant international standards.



#### **QUALITY PRO TEST-CONSULT LIMITED**

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## REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No.

AJ030057

Date of Issue

12 March 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

17H105557

Date of Received

Mar 11, 2020

Date of Calibration

Mar 11, 2020

Date of Next Calibration<sup>(a)</sup>

Jun 10, 2020

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

<u>Parameter</u>

Reference Method

pH at 25°C

APHA 21e 4500-H+ B

Dissolved Oxygen

APHA 21e 4500-O G APHA 21e 2510 B

Conductivity at 25°C 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 <sup>(e)</sup> (pH Unit)	Results
4.00	4.00	0.00	Satisfactory
7.42	7.38	-0.04	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
10.0	10.2	0.2	Satisfactory
26.0	26.6	0.6	Satisfactory
47.0	47.6	0.6	Satisfactory

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

 $\sim$  CONTINUED ON NEXT PAGE  $\sim$ 

#### 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

(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.

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



## **OUALITY PRO TEST-CONSULT LIMITED**

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# REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No.

AJ030057

Date of Issue

12 March 2020

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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
0.38	0.41	0.03	Satisfactory
4.44	4.50	0.06	Satisfactory
6.78	6.75	-0.03	Satisfactory
8.54	8.69	0.15	Satisfactory

Tolerance limit of dissolved oxygen should be less than  $\pm 0.50$  (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	147.7	0.54	Satisfactory
0.01	1412	1467	3.90	Satisfactory
0.1	12890	12767	-0.95	Satisfactory
0.5	58670	59526	1.46	Satisfactory
1.0	111900	110742	-1.03	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	20.48	2.40	Satisfactory
30	30.84	2.80	Satisfactory

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

#### (6) Turbidity

Expected Reading (NTU)	Displayed Reading <sup>(f)</sup> (NTU)	Tolerance <sup>(g)</sup> (%)	Results
0	0.18		Satisfactory
10	10.14	1.4	Satisfactory
20	19.66	-1.7	Satisfactory
100	105.4	5.4	Satisfactory
800	792.6	-0.9	Satisfactory

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

#### Remark(s): -

<sup>~</sup> END OF REPORT ~

<sup>&</sup>quot;Displayed Reading" presents the figures 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 form relevant international standards.

# **CALIBRATION REPORT**

Test Report No.

AJ030007

Date of Issue

05 March 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 - SAMPLE INFORMATION

Description of Samples

Titrette® bottle-top burette, 50mL

**Brand Name** 

**BRAND** 

Model Number

1224B90

Serial Number

10N60623

Date of Received

Mar 02, 2020

Date of Calibration

Mar 05, 2020

Date of Next Calibration(a)

Jun 05, 2020

#### PART C - CALIBRATION REQUESTED

#### **Parameter**

#### Reference Method

Accuracy Test

In-house Method (Gravimetric Method)

~ Continued On Next Page ~

Remark(s): -

<sup>(</sup>a) 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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**CALIBRATION REPORT** 

Test Report No.

: AJ030007

Date of Issue

: 05 March 2020

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PART D - RESULT(b),(c)

Water temperature: 23.0°C

Environmental conditions of the calibration:

Relative humidity: 62%

Z-Factor: 1.0023

Nominal volume: 3.0ml

Trial	Range: (1-4)	Range: (16-19)	Range: (23-26)	Range: (34-37)	Range: (42-45)
1	2.9659	2.9869	2.9688	2.9698	2.9715
2	2.9667	2.9715	2.9725	2.9652	2.9797
3	2.9742	2.9643	2.9697	2.9997	2.9622
4	2.9746	2.9817	2.9716	2.9677	2.9675
5	2.9788	2.9812	2.9800	2.9791	2.9751
6	2.9852	2.9554	2.9912	2.9612	2.9811
7	2.9743	2.9820	2.9877	2.9815	2.9670
8	2.9681	2.9655	2.9796	2.9716	2.9746
9	2.9715	2.9999	2.9812	2.9871	2.9699
10	2.9679	2.9762	2.9618	2.9755	2.9712
Average (g)	2.9727	2.9765	2.9764	2.9758	2.9720
Standard deviation	0.0061	0.0128	0.0091	0.0115	0.0058
Converted volume (mL)	2.9836	2.9874	2.9873	2.9868	2.9829
Error (%)	-0.5457	-0.4207	-0.4222	-0.4413	-0.5704
RSD (%)	0.2029	0.4286	0.3050	0.3845	0.1952

#### Acceptance Criteria (d)

Accuracy (%Error)	< ±1%	<±1%	<±1%	<±1%	<±1%
Precision (%RSD)	< 1%	< 1%	< 1%	< 1%	< 1%

~ END OF REPORT ~

Remark(s): -

<sup>(</sup>b) The results relate only to the tested sample as received

 <sup>(</sup>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) The "acceptance criteria" is applicable for similar equipment used by QPT or quoted from relevant international standards.