

## APPENDIX-5

เอกสารสอบเทียบเครื่องมือการตรวจวิเคราะห์คุณภาพน้ำ




Certificate No. : HIT-2342-1485

Page : 1 of 2

## CERTIFICATE OF CALIBRATION

**Equipment :** COD Test Tube Heater  
**Meter Model :** HI839800-02 **Serial No. :** 05220009101  
**Tube Heater :** 25 Vial Capacity **Accuracy :**  $\pm 2^{\circ}\text{C}$   
**Temperature Range :**  $-10^{\circ}\text{C}$  to  $160^{\circ}\text{C}$  **Temperature of Reaction :**  $150^{\circ}\text{C}$   
**Ambient Temperature :**  $(25 \pm 2)^{\circ}\text{C}$  **Relative Humidity :**  $(50 \pm 15)\% \text{ RH}$   
**Manufacturer :** Hanna Instruments **Made in :** Romania  
**Condition As-Received :** Used Product **Reference :** RE231783  
**Customer name :** Ecotech Water Systems Co., Ltd.  
20 Soi Khaharomklao 74 Yaek 6, Ratphatthana,  
Saphansung, Bangkok 10240  
**Received date :** 11 October 2023  
**Calibrate date :** 16 October 2023  
**Issue date :** 16 October 2023  
**Calibrated Location :** Hanna Instruments (Thailand) Ltd.  
**Calibration Procedure :** This calibrator was conducted by using in-house: calibration procedure  
CP-04 by using certified reference material.

**Calibrated by :** ☒ Mr. Pichit Petthong  
☐ Mr. Channarong Soinak

**Approved by :**   
Mr. Anan Suwanchaisakul

Authorized Signatory  


This certificate was certified only for the instrument we calibrated.

This result of calibration was found accurate on date and place of calibration only.

**\*\* This certificate may not be reproduced other than in full, except with the prior written \*\***

approval of the head of Hanna Instrument (Thailand).

### Condition of this calibration result

### Reference Standard Instruments:

Instruments	Model	Serial No.	Certificate No.	Traceable
Data Acquisition Switch Unit	34970A	MY44065265	WK2307-164-1	WK Electric Co., Ltd.

### Calibration Result:

### Measurement Temperature Source Accuracy for COD Reactor

Capacity (Vial)	Nominal Value ( $^{\circ}\text{C}$ )	Average Value ( $^{\circ}\text{C}$ )	Uncertainty ( $\pm^{\circ}\text{C}$ )	Tolerance of UUC ( $\pm^{\circ}\text{C}$ )	Acceptance Criteria
25 Vial	150.0	150.5	0.49	2	Pass

Figure: Shows the location of the temperature source.

(1A) 150.47 $^{\circ}\text{C}$	(2A) 150.59 $^{\circ}\text{C}$	(3A) 150.12 $^{\circ}\text{C}$	(4A) 150.59 $^{\circ}\text{C}$	(5A) 150.66 $^{\circ}\text{C}$
(1B) 150.31 $^{\circ}\text{C}$	(2B) 150.78 $^{\circ}\text{C}$	(3B) 150.57 $^{\circ}\text{C}$	(4B) 150.37 $^{\circ}\text{C}$	(5B) 150.63 $^{\circ}\text{C}$
(1C) 150.79 $^{\circ}\text{C}$	(2C) 150.79 $^{\circ}\text{C}$	(3C) 150.29 $^{\circ}\text{C}$	(4C) 150.27 $^{\circ}\text{C}$	(5C) 150.62 $^{\circ}\text{C}$
(1D) 150.35 $^{\circ}\text{C}$	(2D) 150.23 $^{\circ}\text{C}$	(3D) 150.79 $^{\circ}\text{C}$	(4D) 149.59 $^{\circ}\text{C}$	(5D) 149.78 $^{\circ}\text{C}$
(1E) 150.70 $^{\circ}\text{C}$	(2E) 150.78 $^{\circ}\text{C}$	(3E) 150.30 $^{\circ}\text{C}$	(4E) 150.97 $^{\circ}\text{C}$	(5E) 150.88 $^{\circ}\text{C}$

Remark: The Acceptance criteria is the error value plus or minus the Measurement Uncertainty, and then Not More than the Tolerance value of UUC, therefore concluded that pass.


The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%.

**\*\* End of certificate \*\***

## CERTIFICATE OF CALIBRATION

**Equipment :** Dissolved Oxygen and BOD Meter  
**Meter Model :** HI98193 **Serial No. :** 07470053101  
**Probe Model :** HI764073 **Serial No. :** KC1N70RCN  
**Manufacturer :** Hanna Instruments **Made in :** Romania  
**Condition As-Received :** Used Product  
**Reference :** RE231783  
**Customer name :** Ecotech Water Systems Co., Ltd.  
20 Soi Khaharomklao 74 Yaek 6, Ratphatthana,  
Saphansung, Bangkok 10240  
**Received date :** 11 October 2023  
**Calibrate date :** 16 October 2023  
**Issue date :** 16 October 2023  
**Ambient Temperature :**  $(25 \pm 2)^{\circ}\text{C}$   
**Relative Humidity :**  $(50 \pm 15)\% \text{ RH}$   
**Calibrated Location :** Hanna Instruments (Thailand) Ltd.  
**Calibration Procedure :** This calibrator was conducted by using in-house: calibration procedure  
CP-11 by using certified reference material (CRM)

**Calibrated by :** ☒ Mr. Pichit Petthong  
☐ Mr. Channarong Soinak

**Approved by :**   
Mr. Anan Suwanchaisakul

Authorized Signatory  


This certificate was certified only for the instrument we calibrated.

This result of calibration was found accurate on date and place of calibration only.

**\*\* This certificate may not be reproduced other than in full, except with the prior written \*\***

approval of the head of Hanna Instrument (Thailand)

### Condition of this calibration result

Reference Standard Instruments : This certification is traceable to the International unit of thru Technology  
Promotion Association (Thailand-Japan).

Instruments	Model	Serial No.	Certificate No.
Thermometer with sensor	HI98509	39643D	23T1453

### Standard Dissolved Oxygen Buffer Solution :

Zero Oxygen Solution	Model No.	Mean Value	Ref. No.	Lot Number	Exp. date
HI7040L	HI7040L	$0.0 \pm 0.1 @ 25^{\circ}\text{C}$	27C32	S0008/23	March 2028

### Calibration Result

Inspection the accuracy of the Dissolved Oxygen (DO) Meter by using the following certificate reference  
material value.

Unit Under Calibration	CRM Standard DO	Actual value Reading	Error value Reading	Uncertainty of Measurement ( $\pm$ )
Electrode Model	0 mg/L	0.00 mg/L	0.00 mg/L	N/A
Serial : KC1N70RCN	8.3 mg/L	8.26 mg/L	-0.04 mg/L	0.33 mg/L

The report uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ ,  
providing a level of confidence of approximately 95%

**\*\* End of certificate \*\***



## Certificate of Calibration

**Certificate No. :** 66-400532-2

**Page : 1 of 2**

**Submitted by :** Ecotech Water Systems Co., Ltd.

20 Soi Kheharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

**Equipment :** Air Chamber (Oven)

Manufacturer : LABTECH

Model : LDO-080F

Range : N/A °C

Resolution : 0.1 °C

Serial No. : 081029024

ID No. : INS007

**Environment :** On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (22.0 to 24.0) °C

Relative Humidity : (55 to 60) %

Line Voltage : (225.5 to 228.5) V

**Date of Received :** 30 September 2023

**Date of Calibration :** 30 September 2023

**Date of Issue :** 06 October 2023

**Calibrated by :** Permpon Chanpu

**Calibration Method :** CAL-M4004, TLAS G-20

The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units

Standard Digital Thermometer with Thermocouple probe

**ID No.**

**Cert. No.**

**Due Date**

**Traceability**

400046 & 400023

66-400547-1

04 Apr 2024

National Institute of Metrology Thailand (NIMT)

Approved by

( Surachai Promthong )

Laboratory Manager



## Certificate of Calibration

**Certificate No. :** 66-400532-2

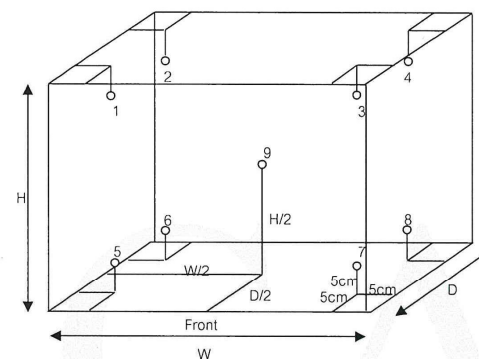
**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

**Function :** Temperature measurement

This instrument was setting air ventilation at position 0 (close)



Inside of Chamber

W = 0.50 m

D = 0.40 m

H = 0.40 m

Capacity = 0.08 m<sup>3</sup>

Test Point ( °C )	Setting Temperature ( °C )	Indicating Temperature ( °C )	Measured Temperature ( °C ) @ Sensor No.									Uncertainty ( ± °C )
			1	2	3	4	5	6	7	8	9	
104.0	104.0	104.0	103.4	103.3	103.5	103.9	103.2	103.3	103.3	104.0	104.2	1.7
180.0	180.0	180.0	178.9	178.0	179.5	180.7	178.4	178.9	179.1	181.5	181.9	3.4

Test Point ( °C )	Setting Temperature ( °C )	Indicating Temperature ( °C )	Measured Uniformity ( °C )	Measured Stability ( °C )	Overall Variation ( °C )
104.0	104.0	104.0	1.7	1.3	3.8
180.0	180.0	180.0	4.9	2.6	8.3

**Remark** The uncertainty is not combine uniformity of the air chamber

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 65-400508-2

**Page : 1 of 2**

**Submitted by :** Ecotech Water Systems Co., Ltd.

20 Soi Kheharonklo 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

**Equipment :** Air Chamber (Oven)

Manufacturer : LABTECH

Model : LDO-080F

Range : N/A °C

Resolution : 0.1 °C

Serial No. : 081029024

ID No. : INS007

**Environment :** On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (22.0 to 24.0) °C

Relative Humidity : (55 to 60) %

Line Voltage : (225.5 to 228.5) V

**Date of Received :** 30 September 2023

**Date of Calibration :** 30 September 2023

**Date of Issue :** 06 October 2023

**Calibrated by :** Permpoon Chanpu

**Calibration Method :** CAL-M4004, TLAS G-20

The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units

Standard Digital Thermometer with Thermocouple probe

**ID No.** **Cert. No.** **Due Date** **Traceability**

400046 & 400023 66-400547-1 04 Apr 2024 National Institute of Metrology Thailand (NIMT)

Approved by

( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

**Certificate No. : 65-400508-2**

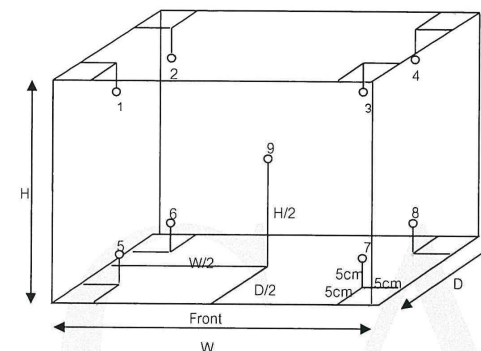
**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

**Function :** Temperature measurement

This instrument was setting air ventilation at position 0 (close)



Inside of Chamber  
W = 0.50 m  
D = 0.40 m  
H = 0.40 m  
Capacity = 0.08 m<sup>3</sup>

Test Point ( ° C )	Setting Temperature ( ° C )	Indicating Temperature ( ° C )	Measured Temperature ( ° C ) @ Sensor No.									Uncertainty ( ± ° C )
			1	2	3	4	5	6	7	8	9	
104.0	104.0	104.0	103.4	103.3	103.5	103.9	103.2	103.3	103.3	104.0	104.2	1.7
180.0	180.0	180.0	178.9	178.0	179.5	180.7	178.4	178.9	179.1	181.5	181.9	3.4

Test Point ( ° C )	Setting Temperature ( ° C )	Indicating Temperature ( ° C )	Measured Uniformity ( ° C )	Measured Stability ( ° C )	Overall Variation ( ° C )
104.0	104.0	104.0	1.7	1.3	3.8
180.0	180.0	180.0	4.9	2.6	8.3

**Remark** The uncertainty is not combine uniformity of the air chamber

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 66-400532-1

**Page : 1 of 2**

**Submitted by :** Ecotech Water Systems Co., Ltd.

20 Soi Khecharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

**Equipment :** Air Chamber (Refrigerator)

Manufacturer : Every Digital

Model : N/A

Range : N/A °C

Resolution : 0.1 °C

Serial No. : ASS1001

ID No. : INS005

**Environment :** On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (22.0 to 24.0) °C

Relative Humidity : (55 to 60) %

Line Voltage : (225.5 to 228.5) V

**Date of Received :** 30 September 2023

**Date of Calibration :** 30 September 2023

**Date of Issue :** 06 October 2023

**Calibrated by :** Permpon Chanpu

**Calibration Method :** CAL-M4004, TLAS G-20

The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units

Standard Digital Thermometer with RTD Probe

**ID No.** **Cert. No.** **Due Date** **Traceability**

400046 & 400047 66-400453-2 02 Feb 2024 National Institute of Metrology Thailand (NIMT)

Approved by

(Signature)

Laboratory Manager



The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 66-400532-1

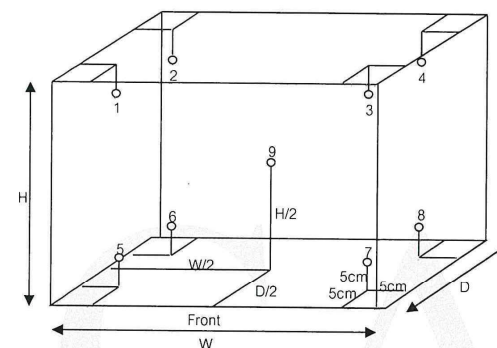
**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

**Function :** Temperature measurement

This instrument was setting air ventilation at position 0 (close)



Inside of Chamber

W = 1.00 m

D = 0.50 m

H = 1.35 m

Capacity = 0.68 m<sup>3</sup>

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty (± °C)
			1	2	3	4	5	6	7	8	9	
4.0	3.0	3.0	4.26	3.98	4.09	4.00	4.07	4.08	3.92	4.08	3.93	0.70

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
4.0	3.0	3.0	0.40	0.38	1.0

**Remark** The uncertainty is not combine uniformity of the air chamber

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-400532-4

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.  
20 Soi Kheharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

Equipment : Air Chamber (Refrigator)

Manufacturer : S-Cool

Model : N/A

Range : N/A °C

Resolution : 1 °C

Serial No. : Eco-Ins14

ID No. : N/A

Environment : On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (22.0 to 24.0) °C

Relative Humidity : (55 to 60) %

Line Voltage : (225.5 to 228.5) V

Date of Received : 30 September 2023

Date of Calibration : 30 September 2023

Date of Issue : 06 October 2023

Calibrated by : Permpon Chanpu

Calibration Method : CAL-M4004, TLAS G-20

The temperature scale used was based on ITS-90

Reference Standard Instruments : This certification is traceable to the International System of Units

Standard Digital Thermometer with RTD Probe

ID No.

Cert. No.

Due Date

Traceability

400046 &amp; 400042 66-400453-1

31 Jan 2024

National Institute of Metrology Thailand (NIMT)

Approved by

(Surachai Promnong)

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-400532-4

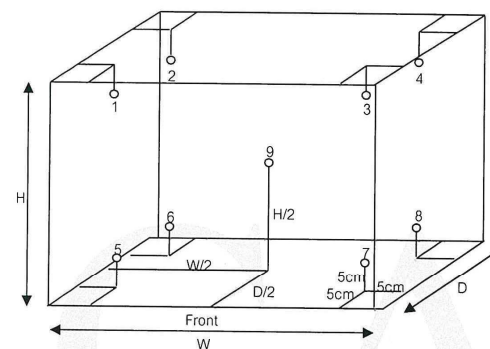
Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement

This instrument was setting air ventilation at position 0 (close)



Inside of Chamber

W = 1.02 m

D = 0.44 m

H = 1.30 m

Capacity = 0.58 m<sup>3</sup>

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty (± °C)
			1	2	3	4	5	6	7	8	9	
4	4	4	5.12	4.79	4.57	4.06	4.73	4.68	3.77	3.61	4.07	1.7

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
4	4	4	1.66	0.94	2.8

Remark The uncertainty is not combine uniformity of the air chamber

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 66-400532-3

**Page : 1 of 2**

**Submitted by :** Ecotech Water Systems Co., Ltd.

20 Soi Kheharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

**Equipment :** Autoclave

Manufacturer : LABTECH

Model : LAC-5060S

Range : N/A °C

Resolution 0.1 °C

Serial No. : 090414007

ID No. : INS008

**Environment :** On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (21.0 to 22.0) °C

Relative Humidity : (40 to 45) %

Line Voltage : (225.0 to 226.5) V

**Date of Received :** 30 September 2023

**Date of Calibration :** 30 September 2023

**Date of Issue :** 06 October 2023

**Calibrated by :** Permpoon Chanpu

**Calibration Method :** This instrument was calibrated by In-house method CAL-M4007 based on BS 2646 Part 1 : 2021

The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units

Standard Temperature Data Logger with RTD pt 100

ID No.	Cert. No.	Due Date	Traceability
400039	66-400358-1	24 Dec 2023	National Institute of Metrology Thailand (NIMT)
400040	66-400358-2	24 Dec 2023	National Institute of Metrology Thailand (NIMT)
400041	66-400358-3	24 Dec 2023	National Institute of Metrology Thailand (NIMT)

Approved

( Surachai Promthong )

Laboratory Manager



The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

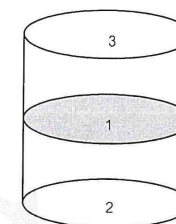
**Certificate No. 66-400532-3**

**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

**Function :** Temperature measurement



Front

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.			Uncertainty (± °C)	Measured Uniformity (°C)	Measured Stability (°C)	Sterilizing Time (minute)	Pressure Gauge Reading (kg/cm²)
			1	2	3					
121.0	121.0	121.0	121.4	121.4	121.3	0.71	0.2	0.2	15	1.2

### Remark

1. UUC : Unit Under Calibration
2. Pressure Gauge reading are out of accreditation's scope.

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-410106-2

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.  
20 Soi Khcharamklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

Equipment : Digital Thermo-Hygrometer  
Manufacturer : Digicon Model : TH-03A  
Range Temperature : -10 °C to 50 °C Resolution : 0.1 °C  
Range Humidity : 20 %R.H. to 99 %R.H. Resolution : 1 %R.H.  
Serial No. : 365051554 ID No. : N/A

Environment : Ambient Temperature : (23 ± 2) °C  
Relative Humidity : (50 ± 15) %

Date of Received : 30 September 2023

Date of Calibration : 03 October to 05 October 2023


Date of Issue : 05 October 2023

Calibrated by : Chortip Samchusri

Calibration Method : This instrument was calibrated by In-house method comparison technique CAL-M4013  
by compared with standard probe sensor humidity/temperature into humidity/temperature chamber.

Reference Standard Instruments : This certification is traceable to the International System of Units  
Digital Indicator with Standard Probe Temp&Hum

ID No.	Cert. No.	Due Date	Traceability
400034 & 400035	SG-H-00502/66	06 Jan 2024	Success Gateway Co., Ltd., Accredited by TISI Calibration No.0268

Approved by   
( Surachai Promthong )  
Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-410106-2

Page : 2 of 2

UUC Condition As-Received : Good

Result of Calibration : Without Adjustment

Function : Temperature measurement ( Mode : In )

Reference Humidity @ 50 %R.H.

Standard Temperature ( °C )	UUC Reading ( °C )	Correction ( °C )	Uncertainty ( ± °C )
19.97	20.2	-0.2	0.46
24.99	25.2	-0.2	0.46
30.02	29.7	0.3	0.46

Result of Calibration : Without Adjustment

Function : Humidity measurement

Reference Temperature @ 25 °C

Standard Humidity ( %R.H. )	UUC Reading ( %R.H. )	Correction ( %R.H. )	Uncertainty ( ± %R.H )
40.04	39	1	2.7
50.01	49	1	2.7
60.00	58	2	2.7

## Remark

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 ,  
providing a level of confidence of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 66-410106-1

**Page : 1 of 2**

**Submitted by :** Ecotech Water Systems Co., Ltd.

20 Soi Kheharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

**Equipment :** Digital Thermo-Hygrometer

Manufacturer : Digicon

Model : TH-03A

Range Temperature : -10 °C to 50 °C

Resolution : 0.1 °C

Range Humidity : 20 %R.H. to 99 %R.H.

Resolution : 1 %R.H.

Serial No. : 365052106

ID No. : N/A

**Environment :** Ambient Temperature : (23 ± 2) °C

Relative Humidity : (50 ± 15) %

**Date of Received :** 30 September 2023

**Date of Calibration :** 03 October to 05 October 2023

**Date of Issue :** 05 October 2023

**Calibrated by :** Chortip Samchusri

**Calibration Method :** This instrument was calibrated by In-house method comparison technique CAL-M4013 by compared with standard probe sensor humidity/temperature into humidity/temperature chamber.

**Reference Standard Instruments :** This certification is traceable to the International System of Units

Digital Indicator with Standard Probe Temp&Hum

**ID No.** **Cert. No.** **Due Date** **Traceability**

400034 & 400035 SG-H-00502/66

06 Jan 2024

Success Gateway Co., Ltd., Accredited by TISI Calibration No.0268

Approved by :

( Surachai Promthong )

Laboratory Manager



The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 66-410106-1

**Page : 2 of 2**

**UUC Condition As-Received :** Good

**Result of Calibration :** Without Adjustment

**Function :** Temperature measurement ( Mode : In )

Reference Humidity @ 50 %R.H.

Standard Temperature ( °C )	UUC Reading ( °C )	Correction ( °C )	Uncertainty ( ± °C )
19.98	20.3	-0.3	0.46
24.98	25.3	-0.3	0.46
30.01	29.8	0.2	0.46

**Result of Calibration :** Without Adjustment

**Function :** Humidity measurement

Reference Temperature @ 25 °C

Standard Humidity ( %R.H. )	UUC Reading ( %R.H. )	Correction ( %R.H. )	Uncertainty ( ± %R.H )
39.98	38	2	3.5
50.01	48	2	3.5
60.03	57	3	3.6

**Remark**

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-410106-3

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.  
20 Soi Kheharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

Equipment : Digital Thermo-Hygrometer

Manufacturer :	N/A	Model :	HTC-2
Range Temperature :	N/A °C	Resolution :	0.1 °C
Range Humidity :	N/A %R.H.	Resolution :	1 %R.H.
Serial No. :	N/A	ID No. :	66-410106-3

Environment : Ambient Temperature : (23 ± 2) °C  
Relative Humidity : (50 ± 15) %

Date of Received : 30 September 2023

Date of Calibration : 03 October to 05 October 2023

Date of Issue : 05 October 2023


Calibrated by : Chortip Samchusri

Calibration Method : This instrument was calibrated by In-house method comparison technique CAL-M4013  
by compared with standard probe sensor humidity/temperature into humidity/temperature chamber.

Reference Standard Instruments : This certification is traceable to the International System of Units

Digital Indicator with Standard Probe Temp&amp;Hum

ID No.	Cert. No.	Due Date	Traceability
400034 & 400035	SG-H-00502/66	06 Jan 2024	Success Gateway Co., Ltd., Accredited by TISI Calibration No.0268

Approved by :   
( Surachai Promthong )  
Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-410106-3

Page : 2 of 2

UUC Condition As-Received : Good

Result of Calibration : Without Adjustment

Function : Temperature measurement ( Mode : In )

Reference Humidity @ 50 %R.H.

Standard Temperature ( °C )	UUC Reading ( °C )	Correction ( °C )	Uncertainty ( ± °C )
19.97	20.5	-0.5	0.46
25.02	25.6	-0.6	0.46
30.01	30.7	-0.7	0.46

Result of Calibration : Without Adjustment

Function : Humidity measurement

Reference Temperature @ 25 °C

Standard Humidity ( %R.H. )	UUC Reading ( %R.H. )	Correction ( %R.H. )	Uncertainty ( ± %R.H. )
40.01	44	-4	4.7
49.97	51	-1	4.7
59.96	57	3	4.8

Remark

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 ,  
providing a level of confidence of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-400533-2

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.  
20 Soi Kheharomklao 74 yeak 6, Ratphatthana, Saphansung, Bangkok 10240

Equipment : Digital Thermometer with Thermistor probe  
Temperature Indicator

Manufacturer : Eutech Model : PC 450  
Range : N/A °C Resolution : 0.1 °C  
Serial No. : 2535550 ID No. : N/A  
Thermistor probe  
Model : N/A Sheath Material : Stainless  
Diameter : 3.5 mm. Length : 100 mm.  
Serial No. : CONSEN91W 141 ID No. : N/A

Environment : On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (22.0 to 24.0) °C  
Relative Humidity : (55 to 60) %  
Line Voltage : (225.0 to 225.9) VAC

Date of Received : 30 September 2023

Date of Calibration : 30 September 2023

Date of Issue : 06 October 2023

Calibrated by : Permpon Chanpu

Calibration Method : This instrument was calibrated by In-house method comparison technique CAL-M4003 by compared with PRT in the liquid bath at the constant controlled temperature.

The temperature scale used was based on ITS-90

Reference Standard Instruments : This certification is traceable to the International System of Units

1. Platinum Resistance Thermometer (PRT)

ID No.	Cert. No.	Due Date	Traceability
400002	TT-0074-22	20 Jun 2024	National Institute of Metrology Thailand (NIMT)

2. Standard Digital Thermometer

ID No.	Cert. No.	Due Date	Traceability
400033	22E569	22 Feb 2024	National Institute of Metrology Thailand (NIMT)

Approved

( Surachai Promthong )  
Laboratory Manager



## Certificate of Calibration

Certificate No. : 66-400533-2

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement

Immersion Depth ( mm. )	Standard Reading ( °C )	UUC Reading ( °C )	Correction ( °C )	Uncertainty ( ± °C )
100	20.003	20.0	0.0	0.19
100	25.005	25.0	0.0	0.19
100	30.002	30.0	0.0	0.19

## Remark

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-400533-1

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.  
20 Soi Kheharomklao 74 yeak 6, Ratphatthana, Saphansung, Bangkok 10240

Equipment : Digital Thermometer with Thermistor probe  
Temperature Indicator

Manufacturer : Eutech Model : PC 700  
Range : N/A °C Resolution : 0.1 °C  
Serial No. : 2728583 ID No. : N/A  
Thermistor probe  
Model : N/A Sheath Material : Stainless  
Diameter : 3.5 mm. Length : 100 mm.  
Serial No. : CONSEN9501D 028 ID No. : N/A

Environment : On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (22.0 to 24.0) °C  
Relative Humidity : (55 to 60) %  
Line Voltage : (225.0 to 225.9) VAC

Date of Received : 30 September 2023

Date of Calibration : 30 September 2023

Date of Issue : 06 October 2023

Calibrated by : Permpon Chanpu

Calibration Method : This instrument was calibrated by In-house method comparison technique CAL-M4003  
by compared with PRT in the liquid bath at the constant controlled temperature.

The temperature scale used was based on ITS-90


Reference Standard Instruments : This certification is traceable to the International System of Units

1. Platinum Resistance Thermometer (PRT)

ID No.	Cert. No.	Due Date	Traceability
400002	TT-0074-22	20 Jun 2024	National Institute of Metrology Thailand (NIMT)

2. Standard Digital Thermometer

ID No.	Cert. No.	Due Date	Traceability
400033	22E569	22 Feb 2024	National Institute of Metrology Thailand (NIMT)

Approved by   
( Surachai Promthong )  
Laboratory Manager



## Certificate of Calibration

Certificate No. : 66-400533-1

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement

Immersion Depth ( mm. )	Standard Reading ( °C )	UUC Reading ( °C )	Correction ( °C )	Uncertainty ( ± °C )
100	20.002	20.3	-0.3	0.19
100	25.001	25.3	-0.3	0.19
100	30.003	30.3	-0.3	0.19

## Remark

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ ,  
providing a level of confidence of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 66-400533-3

**Page : 1 of 2**

**Submitted by :** Ecotech Water Systems Co., Ltd.  
20 Soi Kheharomklao 74 yeak 6, Ratphatthana, Saphansung, Bangkok 10240

**Equipment :** Digital Thermometer with Thermistor probe  
Temperature Indicator  
Manufacturer : Eutech Model : PC 700  
Range : N/A °C Resolution : 0.1 °C  
Serial No. : 3082600 ID No. : N/A  
Thermistor probe  
Model : N/A Sheath Material : Stainless  
Diameter : 3.5 mm. Length : 100 mm.  
Serial No. : CONSEN9501D 102 ID No. : N/A

**Environment :** On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (22.0 to 24.0) °C  
Relative Humidity : (55 to 60) %  
Line Voltage : (225.0 to 225.9) VAC

**Date of Received :** 30 September 2023

**Date of Calibration :** 30 September 2023

**Date of Issue :** 06 October 2023

**Calibrated by :** Permpon Chanpu

**Calibration Method :** This instrument was calibrated by In-house method comparison technique CAL-M4003 by compared with PRT in the liquid bath at the constant controlled temperature.

The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units

1. Platinum Resistance Thermometer (PRT)

ID No.	Cert. No.	Due Date	Traceability
400002	TT-0074-22	20 Jun 2024	National Institute of Metrology Thailand (NIMT)

2. Standard Digital Thermometer

ID No.	Cert. No.	Due Date	Traceability
400033	22E569	22 Feb 2024	National Institute of Metrology Thailand (NIMT)

Approved

( Surachai Promnong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 66-400533-3

**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

**Function :** Temperature measurement

Immersion Depth ( mm. )	Standard Reading ( °C )	UUC Reading ( °C )	Correction ( °C )	Uncertainty ( ± °C )
100	20.002	20.1	-0.1	0.19
100	25.006	25.1	-0.1	0.19
100	30.005	30.1	-0.1	0.19

### Remark

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 66-200308-1

**Page : 1 of 2**

**Submitted by :** Ecotech Water Systems Co., Ltd.  
20 Soi Kheharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

**Equipment :** Electronic Balance  
Manufacturer : OHAUS Model : PA214  
Serial No. : 8328380168 ID No. : INS013  
Capacity : 210 g Resolution : 0.0001 g

**Environment :** On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.  
Ambient Temperature : (25.4 to 25.6) °C  
Relative Humidity : (55.7 to 58.8) %  
Air Pressure : 1011.0 mbar

**Date of Received :** 30 September 2023

**Date of Calibration :** 30 September 2023

**Date of Issue :** 02 October 2023

**Calibrated by :** Akaradath Thippichai

**Calibration Method :** In-house method CAL-M2001 based on UKAS Publication ref : LAB 14  
Edition 7 - November 2022

**Reference Standard Instruments :** This certification is traceable to the International System of Units

Standard Weights

ID No.	Cert. No.	Due Date	Traceability
E261-E2624	C02222345	10 Nov 2023	National Institute of Metrology (Thailand), (NIMT)

Approved by :

( Surachai Promthong )  
Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 66-200308-1

**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

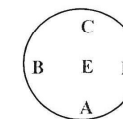
Departure of indication from nominal value

Nominal Value (g)	Correction (g)	Uncertainty ± (g)
0.01	0.0000	0.00011
0.1	0.0000	0.00011
1	0.0000	0.00011
5	0.0000	0.00011
10	0.0000	0.00012
20	0.0000	0.00013
50	0.0000	0.00014
100	-0.0001	0.00020
150	0.0000	0.00038
200	-0.0002	0.00038

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2.11$ , providing a level of confidence of approximately 95%

Eccentric error Load test : 50 g  
A B C D E  
0.0002 0.0002 -0.0001 -0.0001 0.0000 g



Repeatability Load test : 200 g  
Stdev. : 0.00004 g

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## Certificate of Calibration

**Certificate No. :** 66-400532-5

**Page :** 1 of 2

**Submitted by :** Ecotech Water Systems Co., Ltd.

20 Soi Kheharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

**Equipment :** Air Chamber (Incubator)

Manufacturer : Biobase

Model : BJPX-I-250

Range : N/A °C

Resolution : 0.1 °C

Serial No. : BJPXI250230300019B

ID No. : N/A

**Environment :** On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (21.0 to 22.0) °C

Relative Humidity : (40 to 45) %

Line Voltage : (225.0 to 226.5) V

**Date of Received :** 30 September 2023

**Date of Calibration :** 30 September 2023

**Date of Issue :** 06 October 2023

**Calibrated by :** Permpon Chanpu

**Calibration Method :** CAL-M4004, TLAS G-20

The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units

Standard Digital Thermometer with RTD Probe

ID No.

Cert. No.

Due Date

Traceability

400029 & 400048 66-400454-1

05 Feb 2024

National Institute of Metrology Thailand (NIMT)

Approved by

(Surachai Promthong)

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 66-400532-5

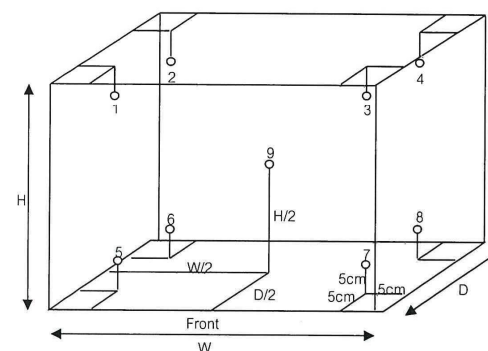
**Page :** 2 of 2

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

**Function :** Temperature measurement

This instrument was setting air ventilation at position 0 (close)



Inside of Chamber

W = 0.48 m

D = 0.49 m

H = 1.07 m

Capacity = 0.25 m<sup>3</sup>

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty (± °C)
			1	2	3	4	5	6	7	8	9	
20.0	20.0	20.0	19.87	19.93	19.94	19.91	20.06	20.09	19.72	19.78	19.84	0.70

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
20.0	20.0	20.0	0.29	0.38	1.1

**Remark** The uncertainty is not combine uniformity of the air chamber

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 66-400532-6

**Page : 1 of 2**

**Submitted by :** Ecotech Water Systems Co., Ltd.

20 Soi Kheharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

**Equipment :** Air Chamber (Incubator)

Manufacturer : Biobase

Model : BJPX-B400II

Range : N/A °C

Resolution : 0.1 °C

Serial No. : KYP400II2010002

ID No. : N/A

**Environment :** On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (21.0 to 22.0) °C

Relative Humidity : (40 to 45) %

Line Voltage : (225.0 to 226.5) V

**Date of Received :** 30 September 2023

**Date of Calibration :** 30 September 2023

**Date of Issue :** 06 October 2023

**Calibrated by :** Permpon Chanpu

**Calibration Method :** CAL-M4004, TLAS G-20

The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units

Standard Digital Thermometer with RTD Probe

ID No.

Cert. No.

Due Date

Traceability

400029 & 400043

66-400226-1

27 Oct 2023

National Institute of Metrology Thailand (NIMT)

Approved by

( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 66-400532-6

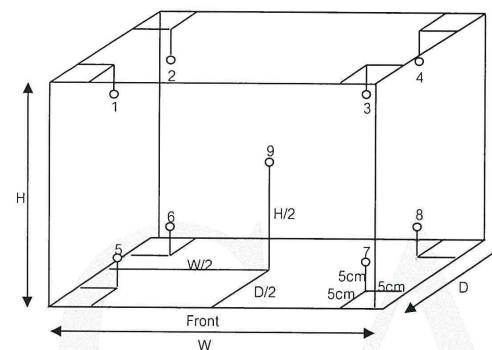
**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

**Function :** Temperature measurement

This instrument was setting air ventilation at position 0 (close)



Inside of Chamber

W = 0.58 m

D = 0.55 m

H = 1.28 m

Capacity = 0.41 m<sup>3</sup>

Test Point ( °C )	Setting Temperature ( °C )	Indicating Temperature ( °C )	Measured Temperature ( °C ) @ Sensor No.									Uncertainty ( ± °C )
			1	2	3	4	5	6	7	8	9	
20.0	20.0	20.0	20.14	20.11	20.05	20.03	20.16	20.15	20.00	19.97	20.00	0.44

Test Point ( °C )	Setting Temperature ( °C )	Indicating Temperature ( °C )	Measured Uniformity ( °C )	Measured Stability ( °C )	Overall Variation ( °C )
20.0	20.0	20.0	0.18	0.20	0.55

**Remark** The uncertainty is not combine uniformity of the air chamber

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-420095-2

Page : 1 of 2

Submitted by :

Ecotech Water Systems Co., Ltd.

20 Soi Kheharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

Equipment :

pH Meter with electrode

pH meter

Manufacturer : Eutech

Model : PC 450

Range : N/A

pH

Resolution : 0.01 pH

Serial No. : 2535550

ID No. : N/A

Electrode

Model : N/A

Serial No. : 01X099323 172

Environment :

On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (22.0 to 24.0)°C

Relative Humidity : (55 to 60) %

Date of Received :

30 September 2023

Date of Calibration :

30 September 2023

Date of Issue :

06 October 2023

Calibrated by :

Permpoon Chanpu

Calibration Method :

In-house method CAL-M4201 direct measurement by using standard voltage calibrator

and using certified reference material (CRM)

Reference Standard Instruments : This certification is traceable to the International System of Units

1. Multiproduct Calibrator

ID No.	Cert. No.	Due Date	Traceability
400005	SG-E-00307/66	23 Aug 2025	National Institute of Metrology Thailand (NIMT)

2. Standard Buffer Solution

pH	Cert. No.	Lot No.	Exp. Date	Traceability
4.008	61270213	915161	19 Jul 2025	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
6.985	61275614	898428	28 May 2024	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
9.997	61281073	915163	19 Jul 2024	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025

Approved by

( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-420095-2

Page : 2 of 2

Result of Calibration :

UUC Condition As-Received : Good

Function :

Electrical measurement

pH meter

Performing standard curve by Multiproduct Calibrator at pH (4,7,10)

Adjustment Curve at nominal pH	Applied Voltage ( mV )	Nominal Value ( pH )	UUC Reading		Correction ( mV )	Uncertainty ( ± mV )
			( pH )	( mV )		
4, 7, 10	177.4800	4	4.00	177.5	0.0	0.12
	0.0000	7	7.00	0.0	0.0	0.086
	-177.4800	10	10.00	-177.5	0.0	0.12

Function :

pH meter with electrode

Performing a three - buffer standard curve using buffer nominal pH (4,7,10)

Adjustment Curve at nominal pH	Standard Buffer ( pH )	UUC Reading ( pH )	Correction ( pH )	Uncertainty ( ± pH )
4, 7, 10	4.008	4.01	0.00	0.0097
	6.985	7.00	-0.01	0.011
	9.997	10.01	-0.01	0.014

Remark

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 ,  
providing a level of confidence of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-420095-1

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.

20 Soi Kheharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

Equipment : pH Meter with electrode

pH meter

Manufacturer : Eutech

Model : PC 700

Range : N/A

pH

Resolution : 0.01 pH

Serial No. : 2728583

ID No. : N/A

Electrode

Model : N/A

Serial No. : 01X099323 022

Environment : On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (22.0 to 24.0) °C

Relative Humidity : (55 to 60) %

Date of Received : 30 September 2023

Date of Calibration : 30 September 2023

Date of Issue : 06 October 2023

Calibrated by : Permpon Chanpu

Calibration Method : In-house method CAL-M4201 direct measurement by using standard voltage calibrator and using certified reference material (CRM)

Reference Standard Instruments : This certification is traceable to the International System of Units

1. Multiproduct Calibrator

ID No. Cert. No. Due Date Traceability

400005 SG-E-00307/66 23 Aug 2025 National Institute of Metrology Thailand (NIMT)

2. Standard Buffer Solution

pH	Cert. No.	Lot No.	Exp. Date	Traceability
4.008	61270213	915161	19 Jul 2025	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
6.985	61275614	898428	28 May 2024	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
9.997	61281073	915163	19 Jul 2024	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025

Approve

( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-420095-1

Page : 2 of 2

Result of Calibration :

UUC Condition As-Received : Good

Function : Electrical measurement

pH meter

Performing standard curve by Multiproduct Calibrator at pH (4,7,10)

Adjustment Curve at nominal pH	Applied Voltage ( mV )	Nominal Value ( pH )	UUC Reading		Correction ( mV )	Uncertainty ( ± mV )
			( pH )	( mV )		
4, 7, 10	177.4800	4	4.00	166.6	10.9	0.12
	0.0000	7	7.00	-8.5	8.5	0.086
	-177.4800	10	10.00	-183.6	6.1	0.12

Function : pH meter with electrode

Performing a three - buffer standard curve using buffer nominal pH (4,7,10)

Adjustment Curve at nominal pH	Standard Buffer ( pH )	UUC Reading ( pH )	Correction ( pH )	Uncertainty ( ± pH )
4, 7, 10	4.008	4.01	0.00	0.0097
	6.985	7.00	-0.01	0.011
	9.997	10.01	-0.01	0.014

Remark

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurment was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

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## Certificate of Calibration

Certificate No. : 66-400095-3

Page : 1 of 2

Submitted by :

Ecotech Water Systems Co., Ltd.

20 Soi Kheharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

Equipment :

pH Meter with electrode

pH meter

Manufacturer : Eutech

Model : PC 700

Range : N/A

pH

Resolution : 0.01 pH

Serial No. : 3082600

ID No. : N/A

Electrode

Model : N/A

Serial No. : 01X099320 511

Environment :

On site calibration was carried out at the Laboratory, Ecotech Water Systems Co., Ltd.

Ambient Temperature : (22.0 to 24.0)°C

Relative Humidity : (55 to 60) %

Date of Received :

30 September 2023

Date of Calibration :

30 September 2023

Date of Issue :

06 October 2023

Calibrated by :

Permpoon Chanpu

Calibration Method :

In-house method CAL-M4201 direct measurement by using standard voltage calibrator

and using certified reference material (CRM)

Reference Standard Instruments : This certification is traceable to the International System of Units

1. Multiproduct Calibrator

ID No.

Cert. No.

Due Date

Traceability

400005

SG-E-00307/66

23 Aug 2025

National Institute of Metrology Thailand (NIMT)

2. Standard Buffer Solution

pH

Cert. No.

Lot No.

Exp. Date

Traceability

4.008

61270213

915161

19 Jul 2025

CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025

6.985

61275614

898428

28 May 2024

CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025

9.997

61281073

915163

19 Jul 2024

CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025

Approved by

( Surachai Promthong )

Laboratory Manager



## Certificate of Calibration

Certificate No. : 66-400095-3

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Result of Calibration :

UUC Condition As-Received : Good

Function :

Electrical measurement

pH meter

Performing standard curve by Multiproduct Calibrator at pH (4,7,10)

Adjustment Curve at nominal pH	Applied Voltage ( mV )	Nominal Value ( pH )	UUC Reading		Correction ( mV )	Uncertainty ( ± mV )
			( pH )	( mV )		
4, 7, 10	177.4800	4	4.00	177.4	0.1	0.12
	0.0000	7	7.00	0.0	0.0	0.086
	-177.4800	10	10.00	-177.4	-0.1	0.12

Function :

pH meter with electrode

Performing a three - buffer standard curve using buffer nominal pH (4,7,10)

Adjustment Curve at nominal pH	Standard Buffer ( pH )	UUC Reading ( pH )	Correction ( pH )	Uncertainty ( ± pH )
4, 7, 10	4.008	4.01	0.00	0.0097
	6.985	7.00	-0.01	0.011
	9.997	10.01	-0.01	0.014

Remark

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95%

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