

ที่ อก ๐๓๑๐(๑)/ ๑๕๕๒๖



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๔ ตุลาคม ๒๕๖๕

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๔ กันยายน ๒๕๖๕

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด จำนวน ๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๙๕ สถานที่ตั้งเลขที่ ๒๐ ซอยเคหะร่มเกล้า ๗๔ แยก ๖
แขวงราษฎร์พัฒนา เขตสะพานสูง กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด ต่ออายุ
หนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

๑) นายเปี่ยมศักดิ์ ไชยสิงห์

ทะเบียนเลขที่ ว-๒๙๕-ค-๐๐๐๑

๒) นางอังสนา ร่มสายหยุด

ทะเบียนเลขที่ ว-๒๙๕-ค-๐๐๐๒

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

๑) นายอนุรักษ์ ตันตราสัย

ทะเบียนเลขที่ ว-๒๙๕-จ-๐๐๐๑

๒) นางสาวปริญานุช หมัดจิ

ทะเบียนเลขที่ ว-๒๙๕-จ-๐๐๐๒

๓) นายนิสิต เหลืองภัทรวงศ์

ทะเบียนเลขที่ ว-๒๙๕-จ-๐๐๐๓

๔) นายประพันธ์ วงษ์เจ๊ะเซ็ม

ทะเบียนเลขที่ ว-๒๙๕-จ-๐๐๐๔

๕) นางสาวสุทธิดา มินกาเซ็ม

ทะเบียนเลขที่ ว-๒๙๕-จ-๐๐๐๕

๖) นางสาวญาณิศา สุวรรณมาศ

ทะเบียนเลขที่ ว-๒๙๕-จ-๐๐๐๖

๗) นางสาววิศรา บุญลาภงามมณี

ทะเบียนเลขที่ ว-๒๙๕-จ-๐๐๐๗

๘) นางสาวจิราพร ฤทธิ์เต็ม

ทะเบียนเลขที่ ว-๒๙๕-จ-๐๐๐๘

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย ตามสิ่งที่ส่งมาด้วย



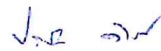
Rail

หนังสือฉบับนี้...

หนังสือฉบับนี้จะหมดอายุในวันที่ ๑๑ ตุลาคม ๒๕๖๘ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อ
กรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม ตาม QR Code
ท้ายหนังสือฉบับนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นายประสม ดำรงพงษ์)
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม



กองวิจัยและเตือนภัยมลพิษโรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙
ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th

ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์





เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด เลขทะเบียน ว-๒๙๕

ที่ อก ๐๓๑๐(๑)/ ๑๕๙๒๖ ลงวันที่ ๒๔ ตุลาคม ๒๕๖๕

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๘ รายการ

น้ำเสีย จำนวน 8 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	5-Day BOD Test, Azide Modification Method
2	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method
3	Oil & Grease	Liquid-Liquid, Partition-Gravimetric Method
4	pH	Electrometric Method
5	Sulfide	Iodometric Method
6	Total Dissolved Solids	Dried at 180 °C
7	Total Kjeldahl Nitrogen	Semi-Micro-Kjeldahl Method
8	Total Suspended Solids	Dried at 103-105 °C

เอกสารอ้างอิง

APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater.
23rd ed. Washington, DC: APHA, 2017.



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°C to 160°C	Temperature of Reaction :	150°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 (°C)	Average Value (°C)	Uncertainty (±°C)	Tolerance of UUC (±°C)	Acceptance Criteria
25 Vial	150.0	150.5	0.49	2	Pass

Figure: Shows the location of the temperature source.

(1A) 150.47°C	(2A) 150.59°C	(3A) 150.12°C	(4A) 150.59°C	(5A) 150.66°C
(1B) 150.31°C	(2B) 150.78°C	(3B) 150.57°C	(4B) 150.37°C	(5B) 150.63°C
(1C) 150.79°C	(2C) 150.79°C	(3C) 150.29°C	(4C) 150.27°C	(5C) 150.62°C
(1D) 150.35°C	(2D) 150.23°C	(3D) 150.79°C	(4D) 149.59°C	(5D) 149.78°C
(1E) 150.70°C	(2E) 150.78°C	(3E) 150.30°C	(4E) 150.97°C	(5E) 150.88°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 No. : HIT-2342-1486

Page : 1 of 2

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 Serial : KC1N70RCN	0 mg/L	0.00 mg/L	0.00 mg/L	N/A
	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

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 66-400532-2

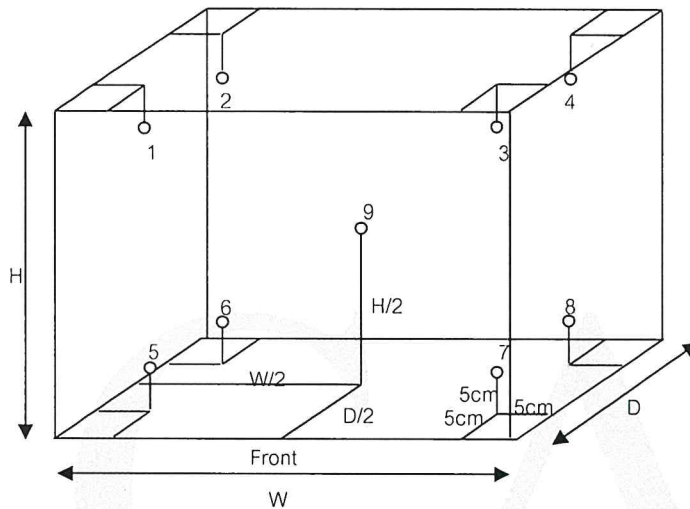
Page : 2 of 2

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 m³

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 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

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
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

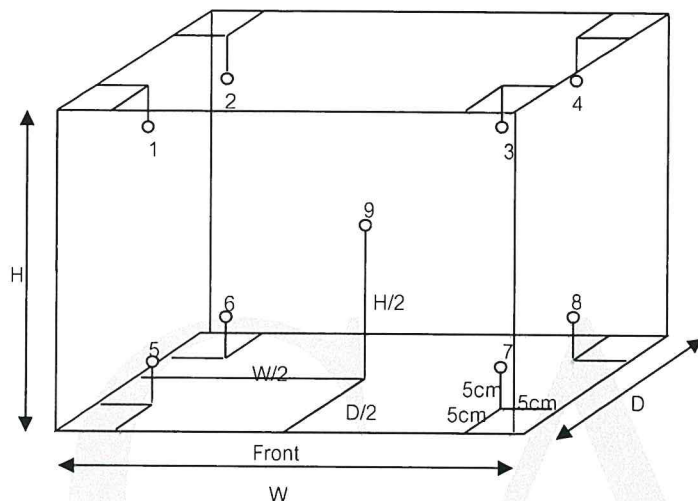
Page : 2 of 2

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 m³

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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ABJ



Certificate of Calibration

Certificate No. : 66-400532-1

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.

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

Equipment : Air Chamber (Refrigarator)

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 :



(Surachai Promthong)

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 66-400532-1

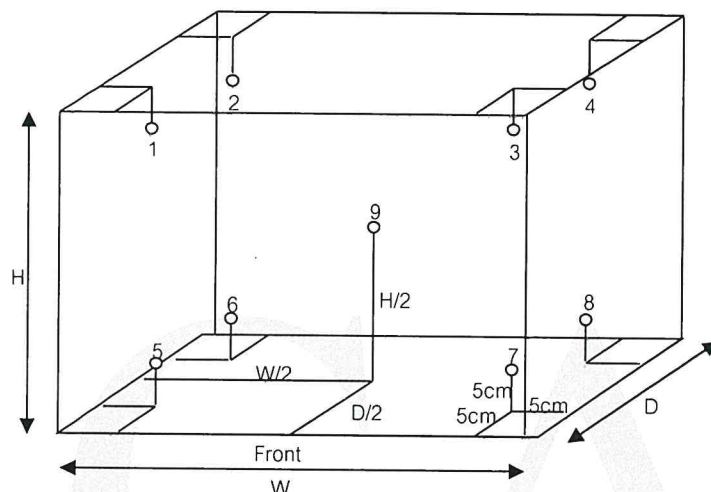
Page : 2 of 2

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 m³

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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Handwritten signature



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 & 400042	66-400453-1	31 Jan 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. : 66-400532-4

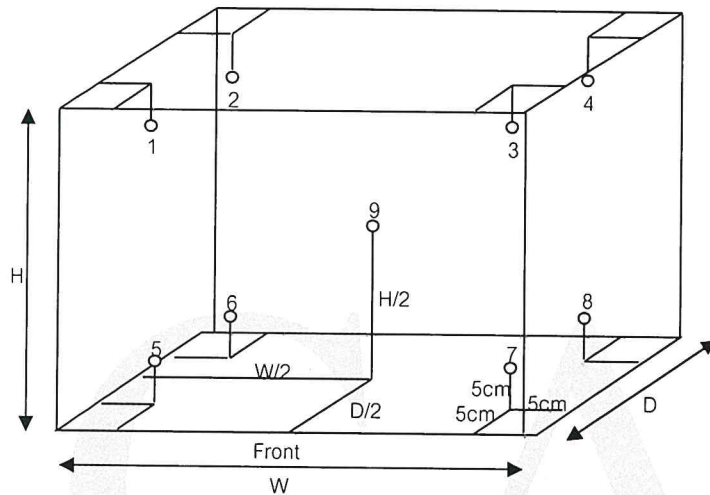
Page : 2 of 2

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 m³

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%

- o0o -

Handwritten signature



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 : Permpon 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

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
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 by :



(Surachai Promthong)

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

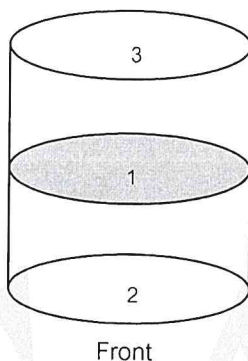
Certificate No. 66-400532-3

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement



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 (kgf/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. 23-TMP-3371

Page 1 of 2

Equipment : Block Digestor
Manufacturer : BIOBASE
Model : BKD-8B
Serial No : XZL8B-202108-116
ID No : -
Location : Temperature Laboratory CLT
Customer name : Ecotech Water Systems Co., Ltd.

Customer Address : 20 Soi Kheharomklao 74 Yak 6, Ratphatthana, Saphansung, Bangkok 10240

Received no. : CAHO23/02185-001

Received Date : 16 Nov 23

Calibration Date : 16 Nov 23

Condition of calibration results :

1. This calibration method was calibrated by insert standard temperature sensors into this chamber of equipment and test according to WI-TMP-016-CC.
2. This certificate is traceable to SI Unit through National Institute of Metrology (Thailand) NIMT.
3. This Temperature Scale is base on ITS-90
4. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of approximately 95%. the uncertainty evaluation has been carried out in accordance with UKAS M3003 requirements.
5. This calibration certificate may not be reproduced other than in full except with the permission of CLT Calibration Laboratory.

Environment Condition :

Temperature : 24 °C to 25 °C
Humidity : 38 %RH to 50 %RH

Condition of Calibration : Good

Description : Calibration Result without Adjustment

Reference Standard :	Standard ID :	Reference no. :	Due Date :	Traceability :
Chub E-4	SRO-37-CC	23-TMP-1226	30 Mar 24	CLT(23-TMP-1226)
TC Type S	TCS-03-CC,TCS-04-CC	23-TMP-1226	30 Mar 24	CLT(23-TMP-1226)

This certificate is traceable to SI unit

Calibrated by : Sutin
Issued Date : 20 Nov 23

Approved by : 
Dachdamrong Songchom

FM-WI-TMP-016-004-CC-R01(01/06/63)P1/2

Certificate of Calibration

Certificate No. : 66-410106-2

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. : 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 : $(23 \pm 2) ^\circ \text{C}$
Relative Humidity : $(50 \pm 15) \%$

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

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
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%

- o0o -



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&Hum

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
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

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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)

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

2. Standard Digital Thermometer

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

Approved by :



(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)

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

2. Standard Digital Thermometer

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

Approved by :



(Surachai Promthong)

Laboratory Manager

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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 yeark 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)

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

2. Standard Digital Thermometer

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
400033	22E569	22 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. : 66-400533-3

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 \pm (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.

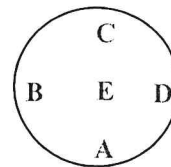
This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor $k = 2.11$, providing a level of confidence of approximately 95%

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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Handwritten signature



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

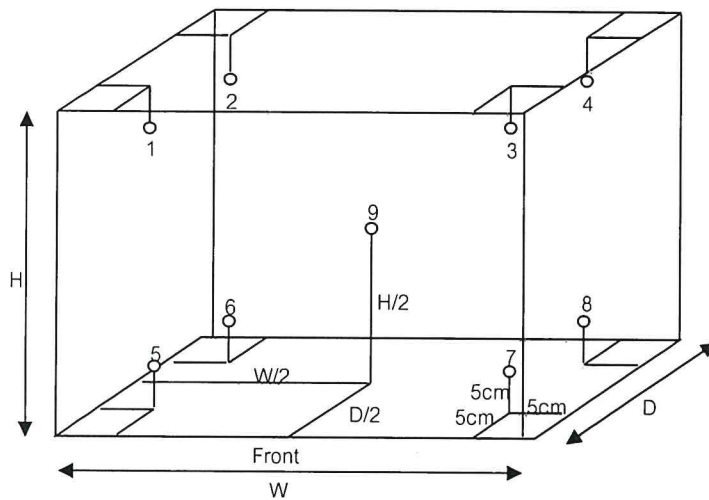
Page : 2 of 2

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 m³

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

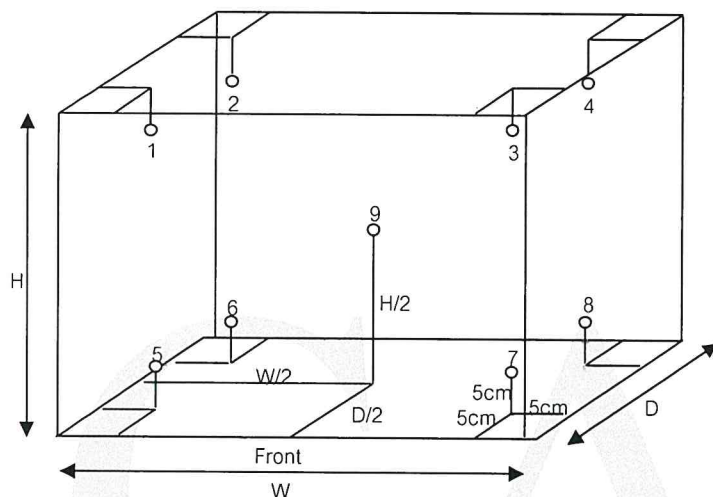
Page : 2 of 2

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 m³

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 : 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

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

2. Standard Buffer Solution

<u>pH</u>	<u>Cert. No.</u>	<u>Lot No.</u>	<u>Exp. Date</u>	<u>Traceability</u>
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 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. : 66-420095-1

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

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. : 66-420095-1

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 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. : 66-400095-3

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 : 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

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. : 66-400095-3

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	177.4	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 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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