



ที่อก ๐๓๑๐(๑)/ ๖๒๘๒

กรมโรงงานอุตสาหกรรม

ถนนพระรามที่ ๖ แขวงทุ่งพญาไท

เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๑ มิถุนายน ๒๕๖๕

เรื่อง เปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๖ พฤษภาคม ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์

บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด จำนวน ๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน
เลขทะเบียน ว-๒๙๕ สถานที่ตั้งเลขที่ ๒๐ ซอยเคหะร่มเกล้า ๗๔ แขวง ๖ แขวงราษฎร์พัฒนา เขตสะพานสูง
กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๔ ราย

- | | |
|------------------------------|----------------------------|
| ๑) นายอดิเทพ พันแสน | ทะเบียนเลขที่ ว-๒๙๕-จ-๘๒๘๙ |
| ๒) นางสาววิธิดา แซ่ตั้ง | ทะเบียนเลขที่ ว-๒๙๕-จ-๘๒๙๑ |
| ๓) นางสาวอัญญา คำหอม | ทะเบียนเลขที่ ว-๒๙๕-จ-๘๒๙๓ |
| ๔) นางสาวจุฬาลักษณ์ ศิริช่าง | ทะเบียนเลขที่ ว-๒๙๕-จ-๘๒๙๔ |

๒. ให้เพิ่มเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ ราย

- | | |
|----------------------------|----------------------------|
| ๑) นางสาวสุทธิดา มินกาเข็ม | ทะเบียนเลขที่ ว-๒๙๕-จ-๙๔๙๐ |
| ๒) นางสาวบุญสิตา พรหมณีนุช | ทะเบียนเลขที่ ว-๒๙๕-จ-๙๔๙๑ |
| ๓) นางสาวญาณิศา สุวรรณมาศ | ทะเบียนเลขที่ ว-๒๙๕-จ-๙๔๙๒ |
| ๔) นายภราดร สัตบุศย์ | ทะเบียนเลขที่ ว-๒๙๕-จ-๙๔๙๓ |
| ๕) นายพลิชฐ์ มากทรัพย์ | ทะเบียนเลขที่ ว-๒๙๕-จ-๙๔๙๔ |

๓. ให้เพิ่มขอขยายสารมลพิษที่วิเคราะห์ในน้ำเสีย จำนวน ๖ รายการ ตามสิ่งที่ส่งมาด้วย

อนึ่ง...

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ที่ ออก ๐๓๑๐(๑)/๑๔๑๔๘ ลงวันที่ ๑๑ ตุลาคม ๒๕๖๒ คือในวันที่ ๑๑ ตุลาคม ๒๕๖๕

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นางจันทา เตชะศรีนทร์)

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

๒๑ มิ.ย. ๒๕๖๕

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๒๐๒ ๔๑๔๖ ๐ ๒๒๐๒ ๔๐๐๒

โทรสาร ๐ ๒๓๕๔ ๓๒๐๘ ๐ ๒๓๕๔ ๓๔๑๕

เอกสารแนบท้ายหนังสือเปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์
บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด เลขทะเบียน ว-๒๙๕
ที่ อก ๐๓๑๐(๑)/ ลงวันที่

ขอข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๖ รายการ

น้ำเสีย จำนวน 6 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	Sulfide	Iodometric Method
5	Total Dissolved Solids	Dried at 180 °C
6	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.


(นางริกาญจน์ อัครสกุลวิไล)
ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบพิษ
แผนทะเบียนห้องปฏิบัติการ



ที่ อก ๐๓๑๐(๑)/ ๓๑๓ ๑

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๐ ๙ มีนาคม ๒๕๖๕

เรื่อง เปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๗ มกราคม ๒๕๖๕

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์
บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด จำนวน ๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน
เลขทะเบียน ว-๒๕๕ สถานที่ตั้งเลขที่ ๒๐ ซอยเคหะร่มเกล้า ๗๔ แยก ๖ แขวงราษฎร์พัฒนา เขตสะพานสูง
กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑ ราย

นายเฉลิมวุฒิ สิงห์วงศ์

ทะเบียนเลขที่ ว-๒๕๕-จ-๘๒๙๒

๒. ให้เพิ่มเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓ ราย

๑) นายอนุรักษ์ ตันตราสัย

ทะเบียนเลขที่ ว-๒๕๕-จ-๐๐๐๑

๒) นางสาวปริญญช หมดจิ

ทะเบียนเลขที่ ว-๒๕๕-จ-๐๐๐๒

๓) นายนิสิต เหลืองภัทรวงศ์

ทะเบียนเลขที่ ว-๒๕๕-จ-๐๐๐๓

๓. ให้เพิ่มขอบข่ายสารมลพิษที่วิเคราะห์ในน้ำเสีย ตามสิ่งที่ส่งมาด้วย

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ที่ อก ๐๓๑๐(๑)/๑๔๑๔๘ ลงวันที่ ๑๑ ตุลาคม ๒๕๖๒ คือในวันที่ ๑๑ ตุลาคม ๒๕๖๕ ทั้งนี้ สามารถยื่นคำขอ
ผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม ตาม QR Code ท้ายหนังสือฉบับนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางจินดา เตชะศรีจันทร์)

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม



ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕ โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์

บริษัท อีโคเทค วอเตอร์ซิสเต็มส์ จำกัด

เลขทะเบียน ว-๒๙๕

ที่ อก ๐๓๑๐(๑)/ ๓๑๓๑


ลงวันที่ ๐๙ มีนาคม ๒๕๖๕

ขอข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑ รายการ

น้ำเสีย จำนวน 1 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Total Kjeldahl Nitrogen	Semi-Micro-Kjeldahl Method

เอกสารอ้างอิง

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

CAL

Calibratech Co., Ltd.

7/106-7 Moo 2, Sukdiaprasasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com



NSC-TISI-TIS17025
CALIBRATION 0030

Certificate of Calibration

Certificate No. : 64-410105-2

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.

20 Soi Kheharomkiao 74 Yak 6, Ratphatthana, Saphanlung, 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 : 05 October 2021

Date of Calibration : 09 October to 11 October 2021

Date of Issue : 11 October 2021

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
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400034 & 400035	SG-H-00664/64	07 Jan 2022	Success Gateway Co., Ltd., Accredited by TISI Calibration No.0268
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Approved by :

(Bunjerd Masri)

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com

Certificate of Calibration

Certificate No. : 64-410105-2

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)
20.01	20.4	-0.4	0.46
24.97	25.3	-0.3	0.46
29.99	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.)
40.00	38	2	2.2
50.01	49	1	2.2
59.99	59	1	2.3

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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B



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Calibratech Co., Ltd.

7/106-7 Moo.2, Sukhprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com



NSIC-TISI-TIS 17025
CALIBRATION 0030

Certificate of Calibration

Certificate No. : 64-410105-1

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 : 05 October 2021

Date of Calibration : 09 October to 11 October 2021

Date of Issue : 11 October 2021

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
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400034 & 400035	SG-H-00664/64	07 Jan 2022	Success Gateway Co., Ltd., Accredited by TISI Calibration No.0268
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Approved by :

(Bunjerd Masri)

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Calibratech Co.,Ltd.

7/106-7 Moo 2, Sukhprachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com

Certificate of Calibration

Certificate No. : 64-410105-1

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)
20.02	20.5	-0.5	0.46
24.99	25.4	-0.4	0.46
30.00	29.9	0.1	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	38	2	2.2
50.01	48	2	2.2
60.01	58	2	2.3

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 -



CAL

Calibratech Co., Ltd.

7/106-7 Moo 2, Sukhprachasan 3 Rd., Bangpood, Pakkred, Northaburi 11120

Tel.(02) 964-6211 Fax:(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com



Certificate of Calibration

Certificate No. : 64-400518-4

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.

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

Equipment : Air Chamber (Refrigerator)

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 : (24.5 to 26.5) °C

Relative Humidity : (45 to 55) %

Line Voltage : (225.0 to 226.5) V

Date of Received : 05 October 2021

Date of Calibration : 05 October 2021

Date of Issue : 07 October 2021

Calibrated by : Bunjerd Masri

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.

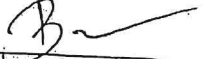
Due Date

Traceability

400046 & 400023 64-400443-1

29 Mar 2022

National Institute of Metrology Thailand (NIMT)

Approved by : 
(Bunjerd Masri)
Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 64-400518-4

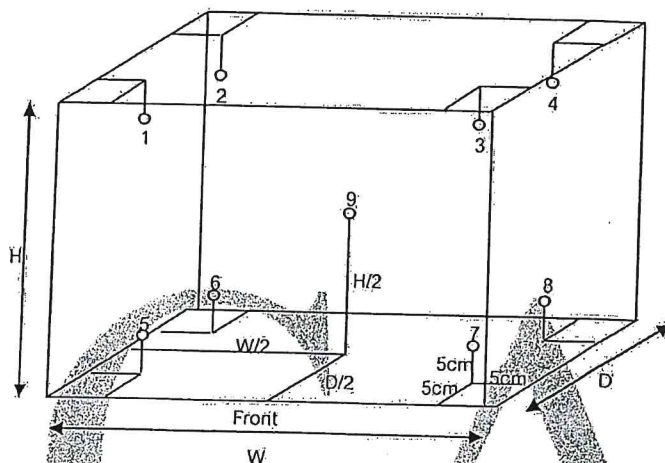
Page : 2 of 2

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	5.1	5.1	4.5	3.7	5.0	5.1	4.2	4.1	4.1	1.4

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
4	4	4	1.3	1.0	2.2

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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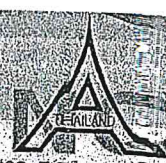


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Certificate of Calibration

Certificate No. : 64-400518-1

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.

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

Equipment : Air Chamber (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 : (24.5 to 26.5) °C

Relative Humidity : (45 to 55) %

Line Voltage : (225.0 to 226.5) V

Date of Received : 05 October 2021

Date of Calibration : 05 October 2021

Date of Issue : 07 October 2021

Calibrated by : Bunjerd Masri

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 & 400043

64-400382-2

23 Jan 2022

National Institute of Metrology Thailand (NIMT)

Approved by :


(Bunjerd Masri)

Supervisor

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CAL-P0031503



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Certificate of Calibration

Certificate No. : 64-420115-1

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. : ECFC7252201B S:10

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

Ambient Temperature : (24.5 to 26.5)°C

Relative Humidity : (45 to 55) %

Date of Received : 05 October 2021

Date of Calibration : 05 October 2021

Date of Issue : 07 October 2021

Calibrated by : Bunjerd Masri

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-00473/64	27 Aug 2023	National Institute of Metrology Thailand (NIMT)

2. Standard Buffer Solution

pH	Cert. No.	Lot No.	Exp. Date	Traceability
4.004	61218215	753167	02 Feb 2022	CPA chem
6.987	61211742	758970	02 Feb 2022	CPA chem
9.961	61223868	753169	02 Feb 2022	CPA chem

Approved by :

(Bunjerd Masri)

Supervisor

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Certificate of Calibration

Certificate No. : 64-420115-1

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	196.5	-19.0	0.12
	0.0000	7	7.00	21.4	-21.4	0.086
	-177.4800	10	10.00	-153.7	-23.8	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	4.004	4.00	0.00	0.011
	6.987	7.00	-0.01	0.020
	9.961	10.00	-0.04	0.053

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. : 64-400519-1

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.

20 Soi Kheliamonklao 74 year 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 : (24.5 to 26.5) °C

Relative Humidity : (45 to 55) %

Line Voltage : (225.0 to 225.9) VAC

Date of Received : 05 October 2021

Date of Calibration : 05 October 2021

Date of Issue : 07 October 2021

Calibrated by : Bunjerd Masri

Calibration Method : This instrument was calibrated by In-house method comparison technique CAL-M4003 by compared with PRT in the dry-well calibrator 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)

400002 FT-0050-20 18 Jun 2022

National Institute of Metrology Thailand (NIMT)

2. Standard Digital Thermometer


ID No. Cert. No. Due Date

400033 20E612 17 Feb 2022

Traceability

National Institute of Metrology Thailand (NIMT)

Approved by :


(Bunjerd Masri)

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Certificate of Calibration

Certificate No. : 64-400519-1

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	25.002	25.3	-0.3	0.19
100	30.002	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. : 64-420115-2

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. : ECFC7252201B 278

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

Ambient Temperature : (24.5 to 26.5)°C

Relative Humidity : (45 to 55) %

Date of Received : 05 October 2021

Date of Calibration : 05 October 2021

Date of Issue : 07 October 2021

Calibrated by : Bunjerd Masri

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-00473/64	27 Aug 2023	National Institute of Metrology Thailand (NIMT)

2. Standard Buffer Solution

pH	Cert. No.	Lot No.	Exp. Date	Traceability
4.004	61218215	753167	02 Feb 2022	CPA chem
6.987	61211742	758970	02 Feb 2022	CPA chem
9.961	61223868	753169	02 Feb 2022	CPA chem

Approved by :

(Bunjerd Masri)

Supervisor

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Certificate of Calibration

Certificate No. : 64-420115-2

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 (\pm 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	-177.6	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 (\pm pH)
4, 7, 10	4.004	4.00	0.00	0.011
	6.987	7.00	-0.01	0.020
	9.961	10.00	-0.04	0.053

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. : 64-400519-2

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. : CONSEN9501D 141

ID No. : N/A

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

Ambient Temperature : (24.5 to 26.5) °C

Relative Humidity : (45 to 55) %

Line Voltage : (225.0 to 225.9) VAC

Date of Received : 05 October 2021

Date of Calibration : 05 October 2021

Date of Issue : 07 October 2021

Calibrated by : Bunjerd Masri

Calibration Method : This instrument was calibrated by In-house method comparison technique CAL-M4003 by compared with PRT in the dry-well calibrator 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)

400002 TT-0050-20 18 Jun 2022

National Institute of Metrology Thailand (NIMT)

2. Standard Digital Thermometer

ID No. Cert. No. Due Date

400033 20E612 17 Feb 2022

Traceability

National Institute of Metrology Thailand (NIMT)

Approved by :

(Bunjerd Masri)

Supervisor

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Certificate of Calibration

Certificate No. : 64-400519-2

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	20.002	20.0	0.0	0.19
100	25.002	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. : 64-400518-6

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 : (24.5 to 26.5) °C

Relative Humidity : (45 to 55) %

Line Voltage : (225.0 to 226.5) V

Date of Received : 05 October 2021

Date of Calibration : 05 October 2021

Date of Issue : 07 October 2021

Calibrated by : Bunjerd Masri

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

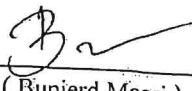
400046 & 400028

64-400443-3

29 Mar 2022

National Institute of Metrology Thailand (NIMT)

Approved by :


(Bunjerd Masri)

Supervisor

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GAT-F0031203



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Certificate of Calibration

Certificate No. : 64-400518-6

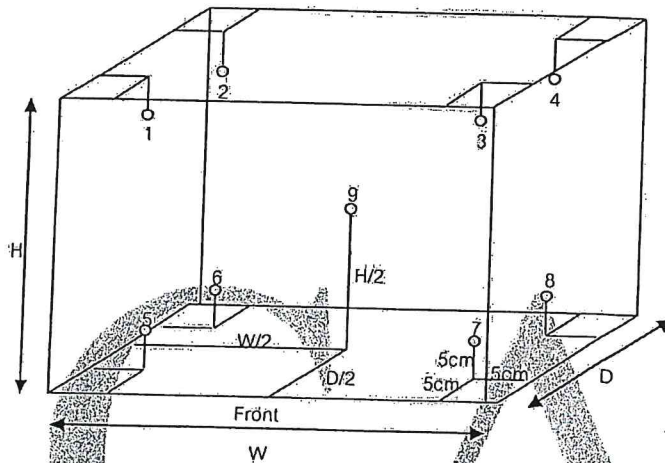
Page : 2 of 2

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 = 0.00 m

D = 0.00 m

H = 0.00 m

Capacity = 0.00 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	20.0	20.0	20.0	20.3	19.6	19.7	19.6	19.7	20.0	0.61

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
20.0	20.0	20.0	0.7	0.2	1.2

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. : 64-400518-5

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.

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

Equipment : Air Chamber (Incubator)

Manufacturer : Accuplus

Model : I250

Range : N/A °C

Resolution : 0.1 °C

Serial No. : I250402-0509-0261

ID No. : INS009

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

Ambient Temperature : (25.0 to 25.5) °C

Relative Humidity : (40 to 45) %

Line Voltage : (225.0 to 226.4) V

Date of Received : 05 October 2021

Date of Calibration : 05 October 2021

Date of Issue : 07 October 2021

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

400029 & 400032 64-400434-1

25 Mar 2022

National Institute of Metrology Thailand (NIMT)

Approved by :

(Bunjerd Masri)

Supervisor

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Certificate of Calibration

Certificate No. : 64-400518-5

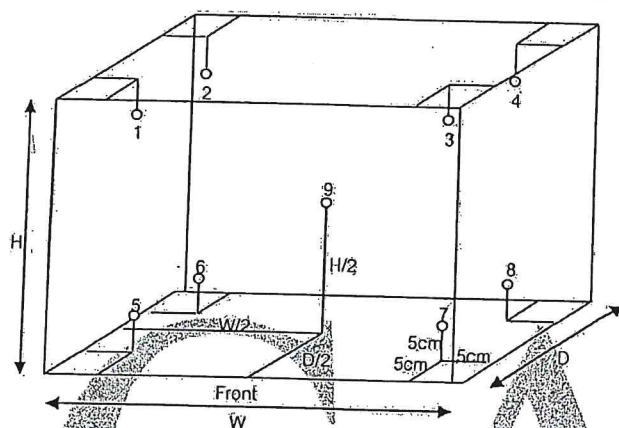
Page : 2 of 2

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 = 0.50 m

D = 0.50 m

H = 1.04 m

Capacity = 0.26 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	20.4	20.3	20.1	20.2	20.2	20.1	20.0	20.1	20.1	0.67	

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
20.0	20.0	20.0	0.3	0.4	0.9

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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Bar



CAL

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Certificate of Calibration

Certificate No. : 64-400518-2

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 : (25.0 to 25.5) °C

Relative Humidity : (40 to 45) %

Line Voltage : (225.0 to 226.4) V

Date of Received : 05 October 2021

Date of Calibration : 05 October 2021

Date of Issue : 07 October 2021


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
400029 & 400030	64-400432-1	25 Mar 2022	National Institute of Metrology Thailand (NIMT)

Approved by : 
(Bunjerd Masri)
Supervisor

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Calibratech Co., Ltd.

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Certificate of Calibration

Certificate No. : 64-400518-2

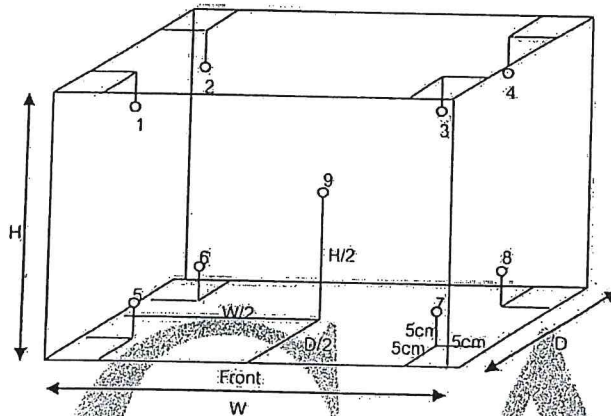
Page : 2 of 2

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	104.9	103.5	105.0	104.9	104.4	104.2	104.7	105.3	104.7	1.7
180.0	180.0	180.0	179.5	178.7	181.0	180.3	178.6	178.9	179.5	181.5	181.0	3.6

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	4.3
180.0	180.0	180.0	3.4	2.9	7.9

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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Calibratech Co., Ltd.

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Tel. (02) 964-6211 Fax. (02) 964-5155, e-mail : calibratech-cal@yahoo.com; calibratech-cal@hotmail.com

Certificate of Calibration

Certificate No. : 64-400522-1

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.

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

Equipment : COD Reactor

Manufacturer : Hanna

Model : HI839800

Range : N/A °C

Resolution : 0.1 °C

Serial No. : 05220009101

ID No. : N/A

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

Relative Humidity : (50 ± 15) %

Date of Received : 06 October 2021

Date of Calibration : 07 October 2021

Date of Issue : 07 October 2021

Calibrated by : Bunjerd Masri

Calibration Method : This instrument was calibrated by In-house method direct measurement with Standard Digital Thermometer with TC Type T probe

The temperature scale used was based on ITS-90

Reference Standard Instruments :

Standard Digital Thermometer with RTD probe

ID No.	Cert. No.	Due Date	Traceability
400046 & 400023	64-400443-1	29 Mar 2022	National Institute of Metrology Thailand (NIMT)
400046 & 400028	64-400443-3	29 Mar 2022	National Institute of Metrology Thailand (NIMT)

Approved by :

(Bunjerd Masri)

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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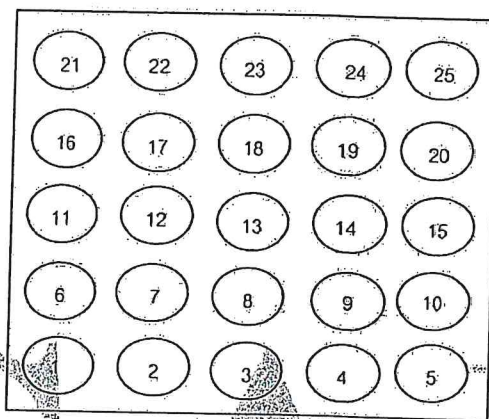
Certificate of Calibration

Certificate No. : 64-400522-1

Page : 2 of 2

Result of Calibration : Without Adjustment

Function : Temperature measurement



Controller

Test Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Standard Reading at Position (°C)									
			1	2	3	4	5	6	7	8	9	10
150.0	150.0	150.0	149.0	149.1	150.8	150.5	148.8	149.7	151.7	149.8	151.2	149.7
Test Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Standard Reading at Position (°C)									
			11	12	13	14	15	16	17	18	19	20
150.0	150.0	150.0	150.7	150.1	152.3	151.5	149.4	151.1	150.9	151.8	151.1	150.4

Test Point (°C)	UUC Setting (°C)	UUC Reading (°C)	Standard Reading at Position (°C)					Uncertainty (± °C)
			21	22	23	24	25	
150.0	150.0	150.0	148.3	150.0	150.5	150.0	148.6	0.74

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. : 64-200292-1

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 : (25.9 to 26.4) °C

Relative Humidity : (49.7 to 50.1) %

Air Pressure : 1008.0 mbar

Date of Received : 05 October 2021

Date of Calibration : 05 October 2021

Date of Issue : 07 October 2021

Calibrated by : Akaradath Thippichai

Calibration Method : In-house method CAL-M2001 based on UKAS Publication ref : LAB 14
Edition 5, July 2015

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

Standard Weights

ID.No.	Cert. No.	Due Date	Traceability
E261-E2624	C02204101	17 Nov 2021	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. : 64-200292-1

Page : 2 of 2

Result of Calibration : After Adjustment

UUC Condition As-Received : Good

Departure of indication from nominal value

Nominal Value (g)	Correction (g)	Uncertainty \pm (g)	Error before Adjustment (g)
0.01	0.0001	0.00011	0.0000
0.1	0.0001	0.00011	0.0000
1	0.0000	0.00011	0.0000
5	0.0000	0.00012	-0.0001
10	0.0001	0.00012	-0.0002
20	0.0000	0.00013	-0.0002
50	0.0000	0.00014	-0.0007
100	-0.0001	0.00020	-0.0012
150	-0.0002	0.00038	-0.0019
200	-0.0004	0.00038	-0.0025

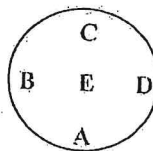
This result of calibration was found accurate as shown on date and place of calibration only.

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 0.0003 0.0001 0.0001 0.0000 g



Repeatability

Load test : 200 g

Stdev. : 0.00005 g

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Certificate of Calibration

Certificate No. : 64-400518-3

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 : (23.0 to 24.0) °C

Relative Humidity : (40 to 45) %

Line Voltage : (225.0 to 226.4) V

Date of Received : 05 October 2021

Date of Calibration : 05 October 2021

Date of Issue : 07 October 2021

Calibrated by : Permpon Chanpu


Calibration Method : This instrument was calibrated by In-house method CAL-M4007 based on BS 2646 Part5 : 1993

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	64-400398-1	07 Feb 2022	National Institute of Metrology Thailand (NIMT)
400040	64-400398-2	07 Feb 2022	National Institute of Metrology Thailand (NIMT)
400041	64-400398-3	07 Feb 2022	National Institute of Metrology Thailand (NIMT)

Approved by : 
(Bunjerd Marsi)

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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CAL-R0031-03



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Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech_cal@yahoo.com, calibratech_cal@hotmail.com

Certificate of Calibration

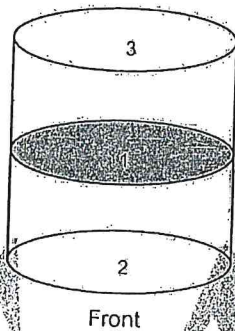
Certificate No. 64-400518-3

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	123.3	122.4	121.7	0.71	0.7	0.1	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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