

ภาคผนวก ฉ

ใบรับรองการสอบเทียบเครื่องมือ

Certificate of Calibration

Certificate No. : 64-400175-1

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.

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

Equipment : Air Chamber (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 : (25.5 to 26.8) °C

Relative Humidity : (54 to 58) %

Line Voltage : (225.0 to 226.4) V

Date of Received : 02 April 2021

Date of Calibration : 02 April 2021

Date of Issue : 02 April 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
400022 & 400023	64-400101-1	01 Sep 2021	National Institute of Metrology Thailand (NIMT)

Approved by :

Supervisor



Certificate of Calibration

Certificate No. : 64-400175-1

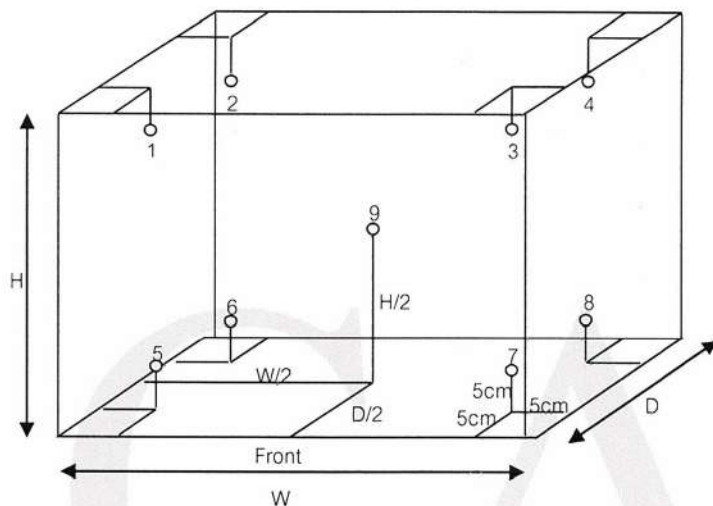
Page : 2 of 2

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 = 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	104.6	104.2	104.7	104.9	104.0	103.7	104.0	105.1	104.2	1.4
180.0	180.0	177.0	178.7	178.6	180.8	180.0	178.5	178.9	178.0	180.8	179.9	3.9

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
104.0	104.0	104.0	1.2	1.0	3.0
180.0	180.0	177.0	2.8	3.3	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

Equipment : COD Test Tube Heater

Meter Model : HI839800-02 **Serial No. :** 05220009101

Manufacturer : Hanna Instruments

Made in : Romania

Condition As-Received : New Product

Reference : RE201211

Customer name : Ecotech Water Systems Co., Ltd.
20 Soi Khaharomklao 74 Yaek 6, Ratphatthana,
Saphansung, Bangkok 10240

Received date : 10 September 2020

Calibrate date : 15 September 2020

Issue date : 15 September 2020

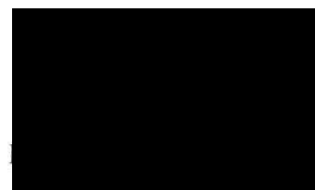
Ambient Temperature : (25 ± 2)°C

Relative Humidity : (50 ± 15)% RH

Calibrated Location : Hanna Instruments (Thailand) Ltd.

Calibrated by :

Calibration Engineer

Approved by :

Authorized Signatory



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approval of the head of Hanna Instrument (Thailand)

Condition of this result of calibration
Reference Standard Instruments :

Instruments	Model	Serial No.	Certificate No.	Traceable
Thermometer With Sensor	HI935005	03250060101	20T74	Technology Promotion Association (Thailand-Japan)

Reference / Procedure :

This equipment was calibration by comparison to the reference standard (Standard platinum resistance thermometer) whose accuracy is traceable to the national standard. The calibration was performed by generating the specified working point of temperature then recorded the temperature reading values against the reference standard according to Hanna Calibration Laboratory work Instruction No. 141.

This temperature scale used was based on ITS-90

All data shown below were as-received values without adjustment.

SITE CALIBRATION

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

Result of Calibration :

Calibration Point	Unit Under Calibration Setting	Unit Under Calibration Reading	Temperature Stability	Uncertainty of Measurement
150.0 (°C)	150.2 (°C)	150.7 (°C)	1.2 (°C)	± 0.38 (°C)

Calibration Point (°C)	Average Standard Reading (°C)				
	Position				
150.0	1	2	3	4	5
	150.4	150.6	151.2	151.1	150.7
	6	7	8	9	10
	150.3	151.0	151.3	151.3	150.8
	11	12	13	14	15
	150.6	151.1	151.3	151.0	150.5
	16	17	18	19	20
	150.3	151.1	151.2	151.1	150.5
	21	22	23	24	25
	150.1	150.3	151.1	150.5	150.3

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

** End of certificate **

Certificate of Calibration

Certificate No. : 63-410086-1

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.
20 Soi Kheharomklao 74 yeak 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 : 06 October 2020

Date of Calibration : 10 October to 14 October 2020

Date of Issue : 14 October 2020

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 & 40003 SG-H-00572/63		15 Jan 2021	Success Gateway Co., Ltd., Accredited by TISI Calibration No.0268

Approved by :



Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 63-410086-1

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)
19.99	20.5	-0.5	0.46
24.98	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)
39.98	38	2	2.2
50.03	48	2	2.2
60.04	57	3	2.3

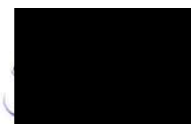
Remark

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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Certificate of Calibration

Certificate No. : 63-410086-2

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.
20 Soi Khcharomklao 74 yeak 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 : 06 October 2020

Date of Calibration : 10 October to 14 October 2020

Date of Issue : 14 October 2020

Calibrated by : Chortip Samchusri

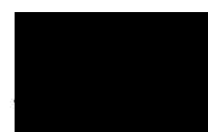
Calibration Method : This instrument was calibrated by In-house method comparison technique CAL-M4013 by compared with standard probe sensor humidity/temperature into humidity/temperature chamber.

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 & 40003 SG-H-00572/63		15 Jan 2021	Success Gateway Co., Ltd., Accredited by TISI Calibration No.0268

Approved by :



Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 63-410086-2

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)
19.99	20.3	-0.3	0.46
24.98	25.2	-0.2	0.46
30.00	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	38	2	2.2
50.04	48	2	2.2
59.96	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%

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Certificate of Calibration

Certificate No. : 63-400520-1

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 ID No. : N/A

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

Ambient Temperature : (23.6 to 24.0) °C
Relative Humidity : (49 to 52) %
Line Voltage : (225.0 to 225.9) VAC

Date of Received : 06 October 2020

Date of Calibration : 06 October 2020

Date of Issue : 12 October 2020

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	Traceability
400033	20E612	17 Feb 2022	National Institute of Metrology Thailand (NIMT)

Approved by :

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 63-400520-1

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	20.003	20.3	-0.3	0.19
100	25.003	25.3	-0.3	0.19
100	30.004	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. : 63-400520-2

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.
20 Soi Kheharomklao 74 year 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 ID No. : N/A

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

Ambient Temperature : (23.6 to 24.0) °C

Relative Humidity : (49 to 52) %

Line Voltage : (225.0 to 225.9) VAC

Date of Received : 06 October 2020

Date of Calibration : 06 October 2020

Date of Issue : 12 October 2020

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 Traceability

400033 20E612 17 Feb 2022 National Institute of Metrology Thailand (NIMT)

Approved by :

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 63-400520-2

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	19.9	0.1	0.19
100	25.003	24.9	0.1	0.19
100	30.004	29.9	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. : 63-200329-1

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 : (29.3 to 30.0) °C
Relative Humidity : (44.5 to 46.8) %
Air Pressure : 1009.0 mbar

Date of Received : 06 October 2020

Date of Calibration : 06 October 2020

Date of Issue : 19 October 2020

Calibrated by : Akaradath Thippichai

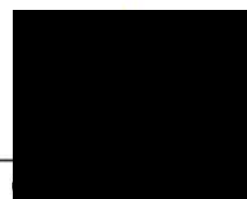
Calibration Method : In-house method CAL-M2001 based on UKAS Publication ref : LAB 14
Edition 5, July 2015

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

Standard Weights

ID No.	Cert. No.	Due Date	Traceability
E261-E2624	C02192873	14 Nov 2020	National Institute of Metrology (Thailand), (NIMT)

Approved by :



Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 63-200329-1

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	-0.0001
1	0.0000	0.00011	-0.0001
5	0.0000	0.00012	-0.0002
10	0.0000	0.00012	-0.0002
20	-0.0001	0.00013	-0.0003
50	-0.0001	0.00014	-0.0008
100	-0.0001	0.00020	-0.0015
150	-0.0001	0.00038	-0.0025
200	-0.0004	0.00038	-0.0032

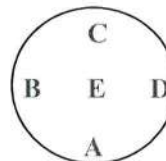
This result of calibration was found accurate as shown on date and place of calibration only.

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	-0.0002	0.0000	0.0000	g



Repeatability

Load test : 200 g

Stdev. : 0.00005 g

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NSC-TISI-TIS 17025
CALIBRATION 0224



CALIBRATION CERTIFICATE

Certificate No. : 20ST0642

Job No. : MENG0006800000210

Issue Date : 11 November 2020

Location of Calibration : Service Room, TN-Science Co.,Ltd.

Customer Name : ECOTECH WATER SYSTEMS CO.,LTD.
20 Soi Kheharomklao 74 yaek 6 ,Ratphatthana ,
Saphansung ,Bangkok 10240

Equipment Name : Temperature Chamber

Manufacturer : BIOBASE

Model : BJPX-B400II

Serial No. : KYP400II2010002

ID No. : -

Resolution : 0.1 °C

Received Date : 9 November 2020

Calibration Date : 9 November 2020

Ambient Temperature : (25 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by : 
Calibration Engineer

Approved by : 
Laboratory Manager

The statement of compliance is based on a 95% coverage probability for the expanded uncertainty.

This certificate may not be reproduced other than in full except with the prior written approval of the head of Calibration Laboratory Department.

DKSH (Thailand) Limited

Technology

141/12 Moo 1, Tambon Payom, TICON Logistics Park (TPARK WANGNOI) Phaholyothin Road km. 55.5, Wangnoi District,
Phra-nakorn Sri Ayutthaya 13170 Phone 0-2301-7208, Fax : 0-3579-9832, E-mail: pramote.r@dksh.com

Delivering growth – in Asia and beyond.

CALIBRATION REPORT

Certificate No. : 20ST0642

Job No. : MENG0006800000210

Condition of this result of calibration :

1. Calibration Procedure :

- This instrument was calibrated by insert 9 standard RTD PT100 into chamber and Calibration according to CP-T06-01 follow up to TLAS G-20-1/02-08 (E) : Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
- The temperature scale used was based on ITS - 90 .
- All data show below were final values and the initial data may be obtained upon request.

2. Reference Standards Instrument :

Instrument	Serial No. / Ins No.	Certificate No.	Traceability	Due Date
Digital Thermometer with RTD	MY49003268 / No. 1	20T0164	DKSH	17 September 2021
	Channel : 101 to 109			

This certificate is traceable to The International System of Unit.

3. Condition of Calibrated item : Good

3.1 UUC Description :

Time Constant 1 Hour 6 Minute At 20 °C

Air value or air slider level : Off ; Fan Level : 100%

4. Result of Calibration : Without adjustment

4.1 Environment condition :

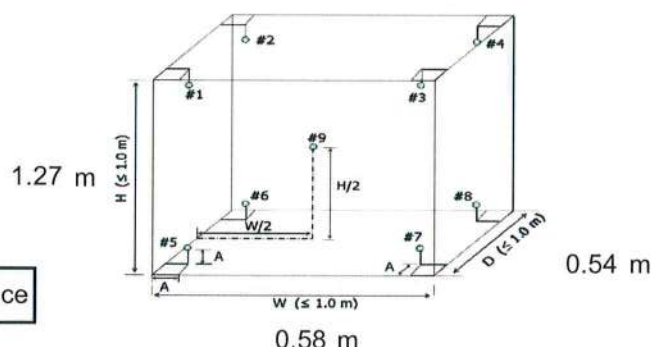
Ambient temperature :	Minimum Value	25.0 °C	Maximum Value	30.0 °C
Relative humidity :	Minimum Value	50.0 %	Maximum Value	60.0 %
Line voltage supplied :	Minimum Value	230 VAC	Maximum Value	235 VAC

4.2 Sensors Installation Diagram :

When ;

A = Distance between sensor and wall of chamber
is 10 % of the length of the each side
(W × D × H)

Sensor installation location in Chamber @ Working Space



CALIBRATION REPORT

Certificate No. : 20ST0642

Job No. : MENG0006800000210

Table1 : Reporting of Temperature

Calibration point (°C)	Average Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty (k = 2) ± (°C)
	#1	#2	#3	#4	#5	#6	#7	#8	#9	
20	20.08	20.00	19.96	20.04	19.92	20.00	19.93	19.90	20.05	0.90

Table 2 : Reporting of Characterization Result

Indicator Set Point (°C)	Indicator Reading (°C)		Stability ± (°C)	Uniformity (°C)	Overall variation (°C)
	MAX	MIN			
20.0	20.0	20.0	0.72	0.38	1.53

Note

The reference sensor is preferably located of the geometric center

The measured temperature data readout by software "Benchlink Datalogger 3"

The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

Stability - one-half of the greatest maximum difference of measured temperatures at any one sensor.

Uniformity - the maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady state conditions.

Overall Variation - The difference of the maximum and minimum measured temperatures throughout observation time.

Indicating Temperature - the average reading of indicating device that forms the integral part of the enclosure.

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

The statements of compliance with specification (or requirement) is based on a 95% coverage probability for the expanded uncertainty of the measurement results on with the decision of compliance is based.

CALIBRATION REPORT

Certificate No. : 20ST0642

Job No. : MENG0006800000210

Result of calibration : Measured Temperature

Calibration Piont (°C)	Correction + Uncertainty (°C)									Gain of UUC : From the specified of the customer ± (°C)	
	#1	#2	#3	#4	#5	#6	#7	#8	#9		
20	0.98	0.90	0.86	0.94	0.82	0.90	0.83	0.80	0.95	1.00	-1.00

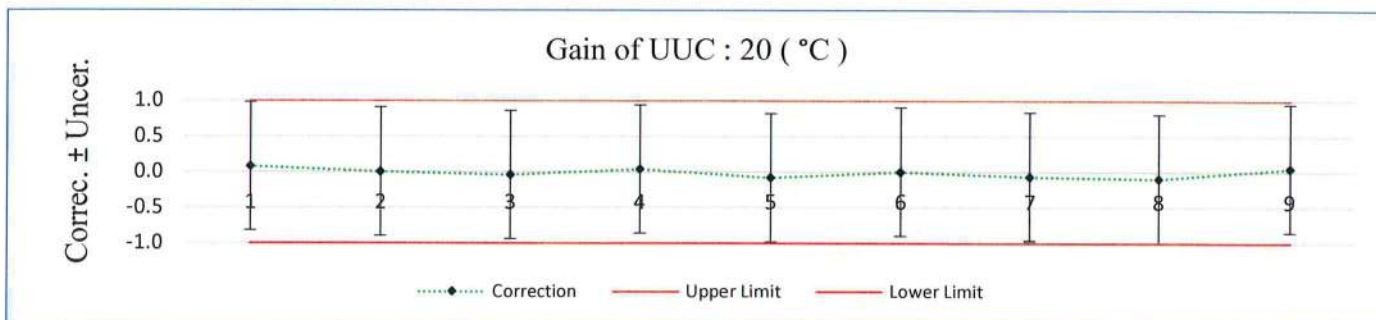
Calibration Piont (°C)	Correction - Uncertainty (°C)									Gain of UUC : From the specified of the customer ± (°C)	
	#1	#2	#3	#4	#5	#6	#7	#8	#9		
20	-0.82	-0.90	-0.94	-0.86	-0.98	-0.90	-0.97	-1.00	-0.85	1.00	-1.00

Measurement results are reported as:

- Pass - acceptance based on simple acceptance; the measurement result being below the acceptance limit, AL=TL
- Fail - rejection based on if the measurement result is above acceptance limit AL=TL

Note :

- AL Meaning Acceptance Limit.
- TL Meaning Tolerance Limit.
- Decision Rules : Type simple acceptance (Customer specified the criteria)



--END--

Certificate of Calibration

Certificate No. : 63-420164-1

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.
20 Soi Khcharomklao 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

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

Ambient Temperature : (23.6 to 24.0)° C

Relative Humidity : (49 to 52) %

Date of Received : 06 October 2020

Date of Calibration : 06 October 2020

Date of Issue : 12 October 2020

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

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
400005	E1U190739	31 Aug 2021	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>
4.004	61208711	684575	10 Apr 2021	CPA chem
6.985	61191143	684576	10 Apr 2021	CPA chem
9.963	61208865	684577	10 Apr 2021	CPA chem

Approved by :

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 63-420164-1

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	0.11
	0.0000	7	7.00	21.4	-21.4	0.086
	-177.4800	10	10.00	-153.7	-23.8	0.11

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	4.01	0.00	0.011
	6.985	7.00	-0.01	0.021
	9.963	10.00	-0.04	0.053

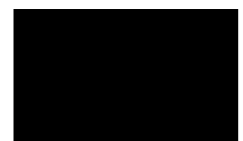
Remark

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%

- 000 -



Certificate of Calibration

Certificate No. : 63-420164-2

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. : 49891

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

Ambient Temperature : (23.6 to 24.0)° C

Relative Humidity : (49 to 52) %

Date of Received : 06 October 2020

Date of Calibration : 06 October 2020

Date of Issue : 12 October 2020

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

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
400005	E1U190739	31 Aug 2021	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>
4.004	61208711	684575	10 Apr 2021	CPA chem
6.985	61191143	684576	10 Apr 2021	CPA chem
9.963	61208865	684577	10 Apr 2021	CPA chem

Approved by

Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 63-420164-2

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	0.11
	0.0000	7	7.00	0.0	0.0	0.086
	-177.4800	10	10.00	-177.5	0.0	0.11

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	4.01	0.00	0.011
	6.985	7.00	-0.01	0.021
	9.963	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 measurment was based on a standard uncertainty multiplied by a coverage factor $k = 2$,
providing a level of confidence of approximately 95%

- 000 -



Certificate of Calibration

Certificate No. : 63-400521-1

Page : 1 of 2

Submitted by : Ecotech Water Systems Co., Ltd.

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

Equipment : Air Chamber (Refrigator)

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 : (24.3 to 25.0) °C

Relative Humidity : (40 to 45) %

Line Voltage : (225.2 to 226.4) V

Date of Received : 06 October 2020

Date of Calibration : 06 October 2020

Date of Issue : 12 October 2020

Calibrated by : Permpon Chanpu

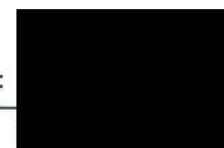
Calibration Method : CAL-M4004, TLAS G-20

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>
400029 & 400030	63-400448-1	29 Mar 2021	National Institute of Metrology Thailand (NIMT)

Approved by :



Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 63-400521-1

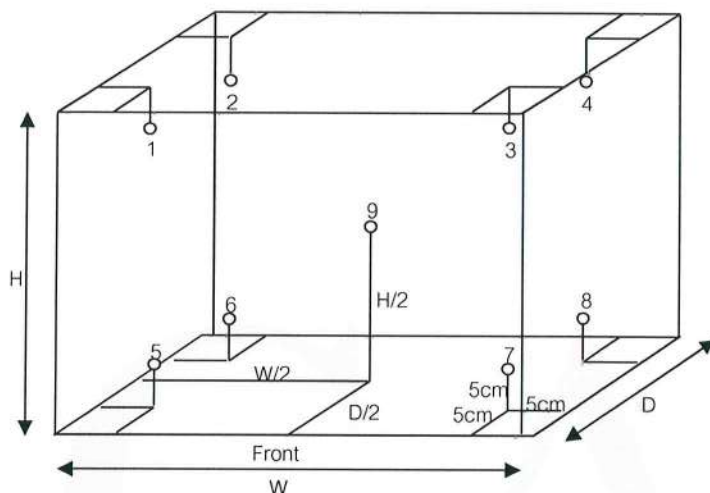
Page : 2 of 2

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
			1	2	3	4	5	6	7	8	9	(± ° C)
4.0	3.0	3.0	4.4	4.3	4.3	4.0	4.3	4.3	3.8	4.1	4.0	0.54

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
4.0	3.0	3.0	0.5	0.1	0.8

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 -



Certificate of Calibration

Certificate No. : 63-400521-2

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 : (26.5 to 27.0) °C

Relative Humidity : (45 to 55) %

Line Voltage : (225.0 to 226.4) V

Date of Received : 06 October 2020

Date of Calibration : 06 October 2020

Date of Issue : 10 October 2020

Calibrated by : Bunjerd Masri

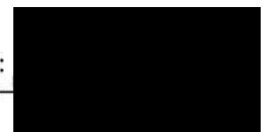
Calibration Method : CAL-M4004, TLAS G-20

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

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
400022 & 400023	63-400445-1	26 Feb 2021	National Institute of Metrology Thailand (NIMT)

Approved by :



Supervisor

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Certificate of Calibration

Certificate No. : 63-400521-2

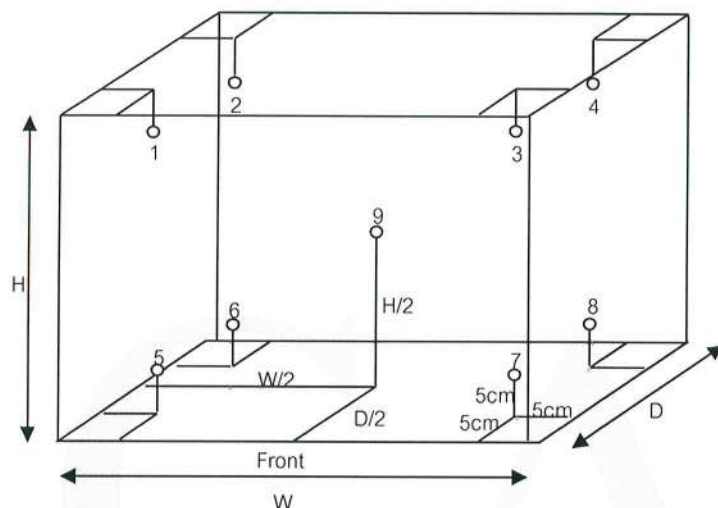
Page : 2 of 2

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	104.6	104.8	104.7	104.2	104.0	104.6	104.1	104.7	104.8	1.8
150.0	150.0	150.0	150.4	149.3	150.8	150.3	149.3	148.9	149.5	150.9	150.7	2.7

Test Point (° C)	Setting Temperature (° C)	Indicating Temperature (° C)	Measured Uniformity (° C)	Measured Stability (° C)	Overall Variation (° C)
104.0	104.0	104.0	1.3	1.4	3.2
150.0	150.0	150.0	2.4	2.2	5.7

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 -



Certificate of Calibration

Certificate No. : 63-400521-3

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 : (25.0 to 26.0) °C
Relative Humidity : (40 to 45) %
Line Voltage : (225.2 to 226.4) V

Date of Received : 06 October 2020

Date of Calibration : 06 October 2020

Date of Issue : 12 October 2020

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

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
400039	63-400444-1	27 Feb 2021	National Institute of Metrology Thailand (NIMT)
400040	63-400444-2	27 Feb 2021	National Institute of Metrology Thailand (NIMT)
400041	63-400444-3	27 Feb 2021	National Institute of Metrology Thailand (NIMT)

Approved by :



Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

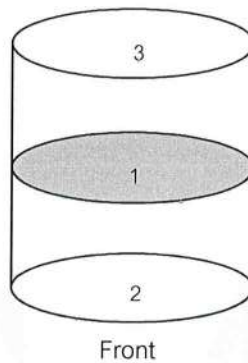
Certificate No. 63-400521-3

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/cm ²)
			1	2	3					
121.0	121.0	121.0	122.1	122.0	121.4	0.71	0.6	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%

- o0o -



Certificate of Calibration

Certificate No. : 63-400521-4 **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 : (24.3 to 25.0) °C
Relative Humidity : (40 to 45) %
Line Voltage : (225.2 to 226.4) V

Date of Received : 06 October 2020

Date of Calibration : 06 October 2020

Date of Issue : 12 October 2020

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	63-400450-1	30 Mar 2021	National Institute of Metrology Thailand (NIMT)

Approved by



Supervisor

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 63-400521-4

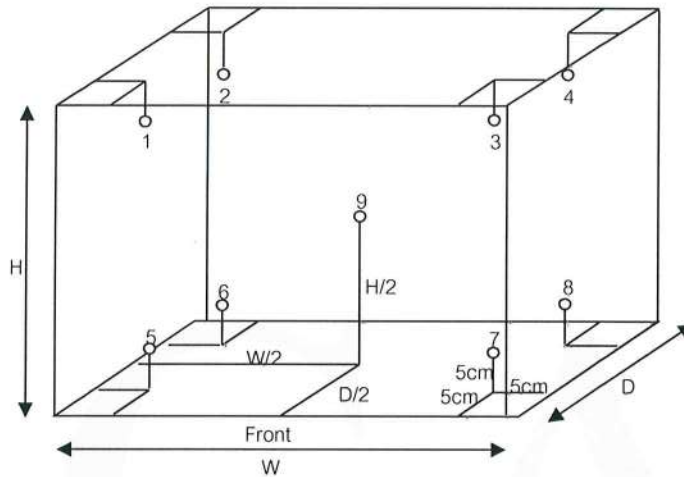
Page : 2 of 2

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	2	2	5.1	4.7	3.6	3.4	4.0	4.0	3.6	3.5	4.0	0.88

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
4	2	2	1.1	0.3	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%

- o0o -





Bangkok High Lab Co.,Ltd.

4/176 Soi Ladplakao 66, Ladplakao Rd., Anusawari, Bangkok, Bangkok 10220

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Website: www.bangkokhighlab.com

Fax: (662) 971-5300

E-mail: info@bangkokhighlab.com



CERTIFICATE OF CALIBRATION

Certificate No : S2020/167

Page : 1/6

Order : 400/2020

Customer : EcoTech Water Systems Co., Ltd.
Address : 20 Soi Kheharomklao 74 yeak 6, Ratphatthana ,
Saphansung, Bangkok 10240
Instrument : UV/VIS spectrophotometer
Manufacture : RAYLEIGH
Model : VIS-723G
Serial Number : 00080889
Environment : Temperature (27.2 - 27.5) °C
Humidity (43 - 40) %RH
Received Date : October 5, 2020
Calibration Date : October 5, 2020
Issue Date : October 15, 2020
Calibrate Status : No Adjustment
Calibration Area : Customer area
Roomname : Laboratory Room of EcoTech Water Systems Co., Ltd.
Calibrated By : [Redacted]
Calibration Engineer
Approved By : [Redacted]
Manager



Bangkok High Lab Co.,Ltd.
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Tel: (662) 971-5800 Fax: (662) 971-5300
Website: www.bangkokhighlab.com E-mail: info@bangkokhighlab.com



Certificate No : S2020/167
Page : 2/6
Order No : 400/2020

1. Photometric Accuracy

CRMs: Neutral Density Glass Filters

CRMs Serial Number: A404

Traceability: Traceable to NIST, U.S.A. through Neutral density filters NIST SRM 930e & 1930, Double Aperture method through Starna certificate report 103934

Spectral slit width : 2.00 nm

1.1 Reading scale at 420.0 nm

Filter STDs (Abs) Certificate	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
0.0000	0.001	-0.0010	0.0028
0.4965	0.497	-0.0005	0.0044
0.9635	0.962	0.0015	0.0038
2.0355	2.032	0.0040	0.0065

1.2 Reading scale at 440.0 nm

Filter STDs (Abs) Certificate	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
0.0000	0.001	-0.0006	0.0028
0.4867	0.487	-0.0003	0.0040
0.9434	0.942	0.0014	0.0040
1.9662	1.970	-0.0040	0.0064

1.3 Reading scale at 465.0nm

Filter STDs (Abs) Certificate	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
0.0000	0.000	0.0000	0.0028
0.4531	0.455	-0.0019	0.0034
0.8774	0.880	-0.0026	0.0040
1.8422	1.847	-0.0047	0.0060



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Website: www.bangkokhighlab.com

E-mail: info@bangkokhighlab.com



Certificate No : S2020/167

Page : 3/6

Order No : 400/2020

1.4 Reading scale at 546.1nm

Filter STDs (Abs) Certificate	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
0.0000	0.000	0.0000	0.0028
0.4703	0.472	-0.0017	0.0028
0.9096	0.911	-0.0014	0.0028
1.8738	1.875	-0.0012	0.0060

1.5 Reading scale at 590 nm

Filter STDs (Abs) Certificate	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
0.0000	0.000	0.0000	0.0028
0.4880	0.488	0.0000	0.0028
0.9457	0.945	0.0007	0.0028
1.9010	1.901	0.0002	0.0060

1.6 Reading scale at 635 nm

Filter STDs (Abs) Certificate	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
0.0000	0.000	0.0000	0.0028
0.4625	0.460	0.0025	0.0028
0.8982	0.896	0.0022	0.0028
1.7819	1.775	0.0069	0.0062



Bangkok High Lab Co.,Ltd.

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Certificate No : S2020/167

Page : 4/6

Order No : 400/2020

2. Photometric Accuracy

CRMs: Potassium Dichromate in Perchloric acid

CRMs Serial Number: 15086

Blank Serial Number: 15178

Traceability: Traceable to NIST, U.S.A. through crystalline potassium dichromate NIST SRM 935a through Starna certificate report 74553

Spectral slit width : 2.00 nm

Wave Length	Certificate (Abs)	Average Measured Value (A)	Correction (A)	Uncertainty \pm (A)
235	0.0000	#N/A	#N/A	#N/A
	0.7358	#N/A	#N/A	#N/A
257	0.0000	#N/A	#N/A	#N/A
	0.8550	#N/A	#N/A	#N/A
313	0.0000	#N/A	#N/A	#N/A
	0.2885	#N/A	#N/A	#N/A
350	0.0000	#N/A	#N/A	#N/A
	0.6359	#N/A	#N/A	#N/A

3. Wavelength Accuracy

Spectral slit width : 2.00 nm

3.1 CRMs: Holmium Glass Filter

CRMs Serial Number: W184/H

Traceability: Traceable to NIST Holmium oxide filter NIST SRM 2034, through Starna certificate report 103930

Filter STDs (nm) Certificate	Average Measured Value (nm)	Correction (nm)	Uncertainty \pm (nm)
241.74	#N/A	#N/A	#N/A
279.44	#N/A	#N/A	#N/A
287.98	#N/A	#N/A	#N/A
334.10	333.8	0.30	0.12
361.10	360.4	0.70	0.12
418.61	418.2	0.41	0.12
453.63	453.0	0.63	0.12
460.05	459.6	0.45	0.12
536.66	536.4	0.26	0.12
637.98	637.4	0.58	0.12



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Fax: (662) 971-5300

E-mail: info@bangkokhighlab.com



Certificate No : S2020/167

Page : 5/6

Order No : 400/2020

3.2 CRMs: Didymium Glass Filter

CRMs Serial Number: W184/D

Traceability: Traceable to NIST Didymium filter NIST SRM 2034, through Starna certificate report 103931

Filter STDs (nm) Certificate	Average Measured Value (nm)	Correction (nm)	Uncertainty ± (nm)
585.29	585	0.09	0.12
684.49	684	0.29	0.12
740.18	740	0.18	0.12
748.48	749	-0.52	0.12
807.03	807	0.23	0.12
879.27	879	0.27	0.12

4. *Stray Light

CRMs: Potassium Chloride aqueous solution

CRMs Serial Number: 5469

Blank Serial Number: 8745

Traceability: Traceable to NIST, U.S.A. crystalline potassium chloride NIST SRM2032, through Starna certificate report 74132

Spectral slit width : 2.00 nm

Wavelength (nm)	Certificate	Average Measured
200.94	>2A	#N/A
200.94	<1%T	#N/A



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Certificate No : S2020/167

Page : 6/6

Order No : 400/2020

5.*Spectral Resolution

CRMs: Toluene in Hexane

CRMs Serial Number: 8697

Blank Serial Number: 8716

Traceability: Traceable to toluene in hexane NIST SRM2034, through Starna certificate report 74133

Spectral slit width (nm)	Abs Ratio
0.5	#N/A
1.0	#N/A
1.5	#N/A
2.0	#N/A
3.0	#N/A

Note : * "Not TISI Accredited" in this certificate have been included for completeness

Remark:

1. Calibrate Method
 - 1.1 Photometric accuracy: In-house method W-SER-001 based on ASTM E925-02 and ASTM E275-01
 - 1.2 Wavelength accuracy: In-house method W-SER-001 based on ASTM E925-02 and ASTM E275-01
 - 1.3 Stray light: Measuring the CRMs in both absorbance and transmittance unit at wavelength 201.23 nm. Base on European Pharmacopoeia V.6.19.3 1984
 - 1.4 Spectral resolution: Measuring the CRMs. The maximum absorbance values were read at closest to 268.7nm and the minimum absorbance values were read at closest 267.0nm. Refer to European Pharmacopoeia V.6.19.3 1984
2. N/A = not available.
3. Uncertainty of Measurement: 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%
4. This result of calibration was found accurate as shown on date and place of calibration only.
5. This report will certify of calibrated equipment only.

- End of Report -

Certificate of Calibration

Certificate No. : 63-210491-1

Page : 1 of 2

Submitted by : Ecotech Water Systems Co.,Ltd.

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

Equipment : Weight

Manufacturer : LS

Material : Stainless Steel

Weight size : 1 g

ID No. : 219528-3-1

Assumed density of weight : 7950 kg / m³

Assumed Air density : 1.2 kg / m³

Environment : Ambient Temperature : (20 ± 2) °C

Relative Humidity : (50 ± 10) %

Air Pressure : 1004.2 mbar

Date of Received : 09 October 2020

Date of Calibration : 14 October 2020

Date of Issue : 14 October 2020

Calibrated by : Wuttichai Swatphong

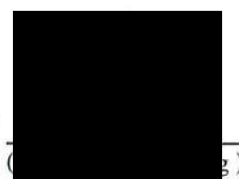
Calibration Method : In-house method CAL-M2101 based on OIML R 111-1 : 2004(E)

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

Standard Weights

ID No.	Cert. No.	Due Date	Traceability
E2413-E2425	MM-0060-19	27 Mar 2022	National Institute of Metrology (Thailand), (NIMT)

Approved by :



Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 63-210491-1

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

No.	Nominal Value	Id.Mark	Conventional mass Value	Measuring Uncertainty
1	1 g	none	1 g +0.017 mg	\pm 0.023 mg

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. : 63-210491-2

Page : 1 of 2

Submitted by : Ecotech Water Systems Co.,Ltd.

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

Equipment : Weight

Manufacturer : LS

Material : Stainless Steel

Weight size : 50 g

ID No. : 219258-1-1

Assumed density of weight : 7950 kg / m³

Assumed Air density : 1.2 kg / m³

Environment : Ambient Temperature : (20 ± 2) °C

Relative Humidity : (50 ± 10) %

Air Pressure : 1004.0 mbar

Date of Received : 09 October 2020

Date of Calibration : 14 October 2020

Date of Issue : 14 October 2020

Calibrated by : Wuttichai Swatphong

Calibration Method : In-house method CAL-M2101 based on OIML R 111-1 : 2004(E)

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

Standard Weights

ID No.	Cert. No.	Due Date	Traceability
E2413-E2425	MM-0060-19	27 Mar 2022	National Institute of Metrology (Thailand), (NIMT)

Approved by :



Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 63-210491-2

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

No.	Nominal Value	Id.Mark	Conventional mass Value		Measuring Uncertainty
1	50 g	none	50 g	-0.086 mg	\pm 0.049 mg

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. : 63-210491-3

Page : 1 of 2

Submitted by : Ecotech Water Systems Co.,Ltd.

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

Equipment : Weight

Manufacturer : LS

Material : Stainless Steel

Weight size : 100 g

ID No. : 219258-2-1

Assumed density of weight : 7950 kg / m³

Assumed Air density : 1.2 kg / m³

Environment : Ambient Temperature : (20 ± 2) °C

Relative Humidity : (50 ± 10) %

Air Pressure : 1003.9 mbar

Date of Received : 09 October 2020

Date of Calibration : 14 October 2020

Date of Issue : 14 October 2020

Calibrated by : Wuttichai Swatphong

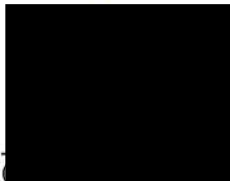
Calibration Method : In-house method CAL-M2101 based on OIML R 111-1 : 2004(E)

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

Standard Weights

ID No.	Cert. No.	Due Date	Traceability
E2413-E2425	MM-0060-19	27 Mar 2022	National Institute of Metrology (Thailand), (NIMT)

Approved by :



Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 63-210491-3

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

No.	Nominal Value	Id.Mark	Conventional mass Value		Measuring Uncertainty
1	100 g	none	100 g	-0.07 mg	\pm 0.11 mg

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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