

ภาคผนวกที่ 11

ผลการเปรียบเทียบอุปกรณ์และเครื่องมือตรวจวัด

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S K SALES AND SERVICE CO.,LTD.

194/56, 194/57 Thakham Rd. Samae Dam

Bang Khun Thian Bangkok 10150

Tel. : 02-417-2144 Fax : 02-417-2155



## Certificate of Calibration

Reference No. : 4561/2402-075 Certificate No. : L2402-1462  
Customer : STS GREEN CO.,LTD. Page 1 of 2

: 3/23 Moo 5, Phaholyothin-Lamlukka Rd.,  
: T.Lat Sawai, A.Lamlukka, Pathumthani, 12150

Equipment : pH Meter

Manufacturer :

Model :

Serial No. :

ID No. :

Received Date : 27 February 2024

Calibrated Date : 29 February 2024

Issued Date : 29 February 2024

pH Meter	pH Electrode
HORIBA	HORIBA
LAQUA-PC210	9652-10D
HG3K0006	Q39K0117
STS 306-24-0003	-

Environment	Start Calibration	Stop Calibration
Ambient Temperature ( °C )	20.5	20.2
Relative Humidity ( % RH )	44	43

Place of Calibration : Chemical Calibration Laboratory

Calibrated by : Miss Sutida Prasansak

### Calibration Method

In-house method : WI-28 based on direct measurement by using certified reference material (CRM) and standard voltage calibrator

### Condition of this result of calibration

#### 1. Reference standard material

pH Solution	Lot No.	Exp Date
1) pH Buffer Solution 4.0	904723	10 June 2025
2) pH Buffer Solution 7.0	904725	10 June 2024
3) pH Buffer Solution 10.0	904724	10 June 2024

#### 2. Reference standard Instrument

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Multifunction Calibrator	CA 150	23MB014	23E3828	18 Nov 24

3. This result of calibration was found accurate as shown on date and place of calibration for this item only

4. This certificate can be traceable to International System of Unit :

- Through Technology Promotion Association (Thailand-Japan)
- Through C.P.A.Chem LTD.

Approved by :

☐ Mr.Suphachai Saksri

☐ Mr.Phayak Tootit

☒ Miss Tantaraporn Pettong

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence level of approximately 95 %

Calibration Result

Calibration by using standard buffer solution

Performing 3 Point calibration standard curve using buffer : 4, 7, 10

STD Buffer Solution (pH)	UUC Reading			UUC Error (pH)	Uncertainty (± pH)	Coverage factor k
	Before Adjust	After Adjustment				
	(pH)	(pH)	(mV)			
4.008	4.24	4.01	175.4	0.002	0.017	2.43
6.985	7.16	7.00	1.0	0.015	0.017	2.05
10.010	10.06	10.00	-169.3	-0.010	0.017	2.00

Calibration by using electrical signals

Performing standard curve by multifunction calibrator at pH : 4, 7, 10

Nominal Value (pH)	Standard Apply (mV)	Actual UUC Reading		Uncertainty ( $\pm$ mV)	Coverage factor k
		(mV)	(pH)		
0.00	414.12	414.2	0.00	0.060	2.00
1.00	354.96	355.0	1.00	0.060	2.00
2.00	295.80	295.8	2.00	0.060	2.00
3.00	236.64	236.6	3.00	0.060	2.00
4.00	177.48	177.5	4.00	0.060	2.00
5.00	118.32	118.4	5.00	0.060	2.00
6.00	59.16	59.2	6.00	0.060	2.00
7.00	0.00	0.1	7.00	0.060	2.00
8.00	-59.16	-59.0	8.00	0.060	2.00
9.00	-118.32	-118.2	9.00	0.060	2.00
10.00	-177.48	-177.4	10.00	0.060	2.00
11.00	-236.64	-236.5	11.00	0.060	2.00
12.00	-295.80	-295.8	12.00	0.060	2.00
13.00	-354.96	-354.9	13.00	0.060	2.00
14.00	-414.12	-414.1	14.00	0.060	2.00

Resolution: 0.01 For pH Function and 0.1 for mV Function

Slope 1 : 98.6 %

Slope 2 : 96 %

STD = Standard

UUC = Unit Under Calibration

\*\* End of Calibration Report \*\*





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Bang Khun Thian Bangkok 10150

Tel. : 02-417-2144 Fax : 02-417-2155



## Certificate of Calibration

Reference No. : 4561/2402-075  
Customer : STS GREEN CO.,LTD.  
: 3/23 Moo 5, Phaholyothin-Lamlukka Rd.,  
: T.Lat Sawai, A.Lamlukka, Pathumthani, 12150  
Equipment : Digital Thermometer  
Manufacturer : HORIBA  
Model : LAQUA-PC210  
Serial No. : HG3K0006  
ID No. : STS 306-24-0003  
Received Date : 27 February 2024  
Calibrated Date : 29 February 2024  
Issued Date : 29 February 2024

Certificate No. : L2402-1463

Page 1 of 2

Environment	Minimum Value	Maximum Value
Ambient Temperature ( °C )	24.6	25.1
Relative Humidity (% RH)	49	51

Place Of Calibration : Temperature Calibration Room

Calibrated by : Mr. Natthapong Koetphon

### Calibration Method

In-house method :SK-WI-01 by comparison technique with temperature standard

### Condition of this result of calibration

1. Reference standard instrument

	Instrument	Model	Serial No.	Certificate No.	Due Date
1)	Temperature indicator with PRT probe	282/AM1730	2502100200037	QR23-2985	8 Dec 24

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

3. This certificate can be traceable to International System of Unit :

- Through Quality Reborn Co.,Ltd.

Approved by :

☐ Mr.Suphachai Saksri

☐ Mr.Phayak Tootit

☒ Miss Tantaraporn Pettong

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

Result of Calibration

This Instrument was Connected with RTD Pt 100 Probe

Stem Diameter : 16 mm

Immersion Depth : 80 mm

Resolution : 0.1 ( $^{\circ}\text{C}$ )

Sheath material : Plastic

Without Adjustment

STD Reading ( $^{\circ}\text{C}$ )	UUC Reading ( $^{\circ}\text{C}$ )	UUC Error ( $^{\circ}\text{C}$ )	Measurement Uncertainty ( $\pm^{\circ}\text{C}$ )
0.014	0.2	0.186	0.25
20.010	20.1	0.090	0.25
25.016	25.1	0.084	0.25
30.012	30.0	-0.012	0.25
45.015	45.0	-0.015	0.25

STD= Standard

UUC= Unit Under Calibration

\*\* End of Calibration Report \*\*



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194/56, 194/57 Thakham Rd. Samae Dam  
Bang Khun Thian Bangkok 10150  
Tel. : 02-417-2144 Fax : 02-417-2155



## Certificate of Calibration

Reference No. : 4561/2402-075 Certificate No. : L2402-1464  
Customer : STS GREEN CO.,LTD. Page 1 of 2  
3/23 Moo 5, Phaholyothin-Lamlukka Rd.,  
T.Lat Sawai, A.Lamlukka, Pathumthani, 12150

Equipment : Conductivity Meter

	Conductivity Indicator	Conductivity Electrode
Manufacturer	HORIBA	HORIBA
Model	LAQUA-PC210	9383
Serial No.	HG3K0006	9B3F0013
ID No.	STS 306-24-0003	-

Received Date : 27 February 2024

Calibrated Date : 29 February 2024

Issued Date : 29 February 2024

Environment	Start Calibration	Stop Calibration
Ambient Temperature ( °C )	20.2	20.1
Relative Humidity ( % RH )	43	43

Place of Calibration : Chemical Calibration Laboratory

Calibrated by : Miss Sutida Prasansak

### Calibration Method

In-house method : WI-29 based on direct measurement by using certified reference material (CRM)

### Condition of this result of calibration

#### 1. Reference standard material

Conductivity Solution	Lot No.	Exp Date
1) Conductivity 1413 $\mu$ S/cm	181023	7 May 24

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

3. This certificate can be traceable to International System of Unit :

- Through National Institute of Metrology (Thailand)

Approved by :

☐ Mr.Suphachai Saksri

☐ Mr.Phayak Tootit

☒ Miss Tantaraporn Pettong

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence level of approximately 95 %



## Before Adjustment

STD Buffer Solution	UUC Reading	UUC Error	Uncertainty (±)	Unit
1412.60	1385	-27.60	9.7	μS/cm

## After Adjustment

STD Buffer Solution	UUC Reading	UUC Error	Uncertainty (±)	Unit	Coverage factor k
1412.60	1417	3.90	9.7	μS/cm	2.00

Resolution : 1 μS/cm

STD = Standard

UUC = Unit Under Calibration

\*\* End of Calibration Report \*\*





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Bang Khun Thian Bangkok 10150

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## Certificate of Calibration

Reference No. : 4561/2402-075  
Customer : STS GREEN CO.,LTD.  
: 3/23 Moo 5, Phaholyothin-Lamlukka Rd.,  
: T.Lat Sawai, A.Lamlukka, Pathumthani, 12150  
Equipment : Digital Thermometer  
Manufacturer : HORIBA  
Model : LAQUA-PC210  
Serial No. : HG3K0006  
ID No. : STS 306-24-0003  
Received Date : 27 February 2024  
Calibrated Date : 29 February 2024  
Issued Date : 29 February 2024

Certificate No. : L2402-1465

Page 1 of 2

Environment	Minimum Value	Maximum Value
Ambient Temperature ( °C )	24.6	25.1
Relative Humidity ( % RH )	49	51

Place Of Calibration : Temperature Calibration Room

Calibrated by : Mr. Natthapong Koetphon

### Calibration Method

In-house method :SK-WI-01 by comparison technique with temperature standard

### Condition of this result of calibration

#### 1. Reference standard instrument

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Temperature indicator with PRT probe	282/AM1730	2502100200037	QR23-2985	8 Dec 24

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

3. This certificate can be traceable to International System of Unit :

- Through Quality Reborn Co.,Ltd.

Approved by :

☐ Mr.Suphachai Saksri

☐ Mr.Phayak Tootit

☒ Miss Tantaraporn Pettong

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



Result of Calibration

This Instrument was Connected with RTD Pt 100 Probe

Stem Diameter : 16 mm

Immersion Depth : 70 mm

Resolution : 0.1 ( $^{\circ}\text{C}$ )

Sheath material : Plastic

Without Adjustment

STD Reading ( $^{\circ}\text{C}$ )	UUC Reading ( $^{\circ}\text{C}$ )	UUC Error ( $^{\circ}\text{C}$ )	Measurement Uncertainty ( $\pm^{\circ}\text{C}$ )
0.011	0.3	0.289	0.39
20.016	20.1	0.084	0.39
25.009	25.0	-0.009	0.39
30.014	30.0	-0.014	0.39
45.016	45.0	-0.016	0.39

STD= Standard

UUC= Unit Under Calibration

\*\* End of Calibration Report \*\*

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## Certificate of Calibration

Reference No. : 4561/2410-083  
Customer : STS GREEN CO.,LTD.  
Certificate No. : L2410-1253  
Page 1 of 2

Equipment : pH Meter

Manufacturer :

Model :

Serial No. :

ID No. :

Received Date :

Calibrated Date :

Issued Date :

pH Meter	pH Electrode
HORIBA	HORIBA
D-51	9651
S007250	983M0012
PHM05	-

24 October 2024

25 October 2024

29 October 2024

Environment	Start Calibration	Stop Calibration
Ambient Temperature ( °C )	19.7	19.9
Relative Humidity ( % RH )	48	50

Place of Calibration : Chemical Calibration Laboratory

Calibrated by : Miss Sutida Prasansak

### Calibration Method

In-house method : WI-28 based on direct measurement by using certified reference material (CRM)

### Condition of this result of calibration

1. Reference standard material

pH Solution	Lot No.	Exp Date
1) pH Buffer Solution 4.0	904723	10 June 2025
2) pH Buffer Solution 7.0	986243	25 April 2025
3) pH Buffer Solution 10.0	986244	25 April 2025

2. This result of calibration was found accurate as shown on date and place of calibration for this item only

3. This certificate can be traceable to International System of Unit :

- Through C.P.A.Chem LTD.

Approved by :

( Mr.Suphachai Saksri )

Authorized Signatory



The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence level of approximately 95 %

Calibration Result

Calibration by using standard buffer solution

Performing 3 Point calibration standard curve using buffer : 4, 7, 10

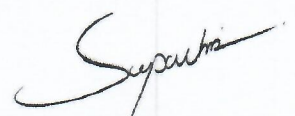
STD Buffer Solution (pH)	UUC Reading		UUC Error	Uncertainty ( $\pm$ pH)	Coverage factor k
	Before Adjust	After Adjust			
4.008	4.14	3.98	-0.028	0.017	2.10
6.986	7.18	6.97	-0.016	0.017	2.07
9.997	10.48	10.04	0.043	0.017	2.13

Resolution: 0.01 for pH Function

STD = Standard

UUC = Unit Under Calibration

\*\* End of Calibration Report \*\*







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## Certificate of Calibration

Reference No. : 4561/2410-083  
Customer : STS GREEN CO.,LTD.  
: 3/23 Moo 5, Phaholyothin-Lamlukka Rd.,  
: T.Lat Sawai, A.Lamlukka, Pathumthani, 12150  
Equipment : Digital Thermometer  
Manufacturer : HORIBA  
Model : D-51  
Serial No. : S007250  
ID No. : PHM05  
Received Date : 24 October 2024  
Calibrated Date : 25 October 2024  
Issued Date : 29 October 2024

Certificate No. : L2410-1254

Page 1 of 2

Environment	Minimum Value	Maximum Value
Ambient Temperature ( °C )	25.3	26.0
Relative Humidity ( % RH )	56	58

Place Of Calibration : Temperature Calibration Room

Calibrated by : Mr. Natthapong Koetphon

### Calibration Method

In-house method :SK-WI-01 by comparison technique with temperature standard

### Condition of this result of calibration

1. Reference standard instrument

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Temperature indicator with PRT probe	282/AM1730	250210020037	QR23-2985	8 December 2024

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

3. This certificate can be traceable to International System of Unit :

- Through Quality Reborn Co.,Ltd.

Approved by :

( Mr.Suphachai Saksri )

Authorized Signatory



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

Result of Calibration

This Instrument was Connected with Thermister Probe

Stem Diameter : 12 mm

Immersion Depth : 80 mm

Resolution : 0.1 ( $^{\circ}\text{C}$ )

Sheath material : Plastic

Without Adjustment

STD Reading ( $^{\circ}\text{C}$ )	UUC Reading ( $^{\circ}\text{C}$ )	UUC Error ( $^{\circ}\text{C}$ )	Measurement Uncertainty ( $\pm$ $^{\circ}\text{C}$ )
0.010	0.0	-0.010	0.16
20.012	20.0	-0.012	0.16
25.009	25.0	-0.009	0.16
30.011	30.0	-0.011	0.16
45.013	44.9	-0.113	0.16

STD= Standard

UUC= Unit Under Calibration

\*\* End of Calibration Report \*\*





## Certificate of Calibration

**Certificate No. :** 67-400083-1

**Page : 1 of 2**

**Submitted by :** STS Green Company Limited  
3/23 Moo 5, T. Lad Sawai, A. Lumlukka, Pathumthani 12150

**Equipment :** Temperature controlled enclosure (Oven)  
**Manufacturer :** Memmert **Model :** UFE 500  
**Range :** N/A °C **Resolution :** 0.5 °C  
**Serial No. :** G509.0607 **ID No. :** HOA 03

**Environment :** On site calibration was carried out at the Laboratory, STS Green Company Limited  
**Ambient Temperature :** (29.0 to 30.0) °C  
**Relative Humidity :** (60 to 65) %  
**Line Voltage :** (223.5 to 224.5) V

**Date of Received :** 16 February 2024

**Date of Calibration :** 16 February 2024

**Date of Issue :** 20 February 2024

**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	66-400595-1	26 Apr 2024	National Institute of Metrology Thailand (NIMT)

Approved by :



( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full except with the prior written approval of the Calibratech Co.,Ltd.





## Certificate of Calibration

Certificate No. : 67-400083-1

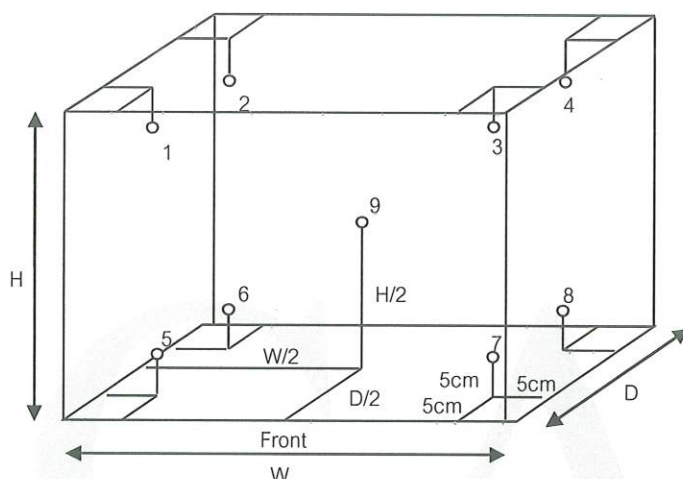
Page : 2 of 2

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 = 0.56 m

D = 0.40 m

H = 0.48 m

Capacity = 0.11 m<sup>3</sup>

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty (± °C)
			1	2	3	4	5	6	7	8	9	
104.0	104.0	104.0	104.2	104.0	104.2	104.2	103.9	103.9	103.8	103.8	103.8	0.80
180.0	180.0	180.0	180.9	180.3	180.6	180.4	180.1	180.1	179.7	179.7	179.7	1.0

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
104.0	104.0	104.0	0.7	0.3	0.8
180.0	180.0	180.0	1.4	0.3	1.6

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%

- oOo -

*Signature*



**QUALITY CALIBRATION CO., LTD.**

235 Petchkasem 63/2 Road, Laksong, Bangkae, Bangkok 10160

Tel (662) 421-5402, (662) 444-0152-3, Fax (662) 809-4584

www.qcalibration.com

NSC-TISI-TISI 7025  
CALIBRATION 0049

CERTIFICATE No : 24T7224

REFERENCE No : 73978-1

PAGE : 1 OF 2

**Certificate of Calibration**

**EQUIPMENT** : OVEN

**MANUFACTURER** : MEMMERT

**MODEL** : UFE500

**SERIAL No** : G509.0605


**ID No** : HOA 02

**CONDITION AS RECEIVED** : USED ITEM

**SUBMITTED BY** : STS GREEN CO., LTD.  
3/23 MOO 5, TAMBOL LAT SAWAI, AMPHUR LAM LUK KA,  
PATHUM THANI 12150

**CALIBRATED BY** : SUCHART S.

**CALIBRATION DATE** : 18-Jul-24

**APPROVED BY** :   
PONGSAK J.

**ISSUED DATE** : 24-Jul-24

**RECEIVED DATE** : 18-Jul-24





# QUALITY CALIBRATION CO., LTD.

235 Petchkasem 63/2 Road, Laksong, Bangkae, Bangkok 10160

Tel (662) 421-5402, (662) 444-0152-3, Fax (662) 809-4584

CERTIFICATE No : 24T7224

PAGE : 2 OF 2

## Calibration Report

EQUIPMENT : OVEN  
MANUFACTURER : MEMMERT  
MODEL : UFE500  
ID No : HOA 02  
RECEIVED DATE : 18-Jul-24  
AMBIENT TEMPERATURE : 29 °C ± 1 °C

S/N : G509.0605  
CALIBRATION DATE : 18-Jul-24  
RELATIVE HUMIDITY : 52 %RH ± 10 %RH

### CONDITION OF THIS RESULTS OF CALIBRATION

1. THIS INSTRUMENT WAS CALIBRATED ACCORDING TO TLAS G-20 BY COMPARISON WITH CALIBRATED THERMOCOUPLE TYPE K OR TYPE K UNDER NO LOAD CONDITION. THE THERMOCOUPLES WERE PLACED ON NINE POINTS AND LOCATED ONE THERMOCOUPLE IN EACH OF THE EIGHT CORNERS OF THE CHAMBER AND WAS AWAY FROM THE EACH WALL OF 5 cm TO 10 cm. AND PLACED THE NINTH THERMOCOUPLE WITHIN 2.5 cm. OF THE GEOMETRIC CENTER OF THE CHAMBER. THE UNIFORMITY WAS MEASURED BETWEEN REFERENCE PROBE AND OTHER PROBES AT THE SAME TIME.

2. REFERENCE STANDARD INSTRUMENTS :-

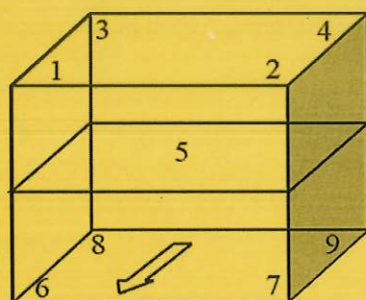
INSTRUMENT	MODEL	SERIAL No	CERTIFICATE No	DUE DATE
1) DATA LOGGER WITH TC TYPE K	HYDRA 2635A	7286308	24T6471	24-Jun-25

3. THE CERTIFICATE IS VALID FOR THE ITEM CALIBRATED AS SHOWN ON THE DATE AND PLACE OF CALIBRATION ONLY.

4. THIS RESULT EXCLUDE LONG TERM STABILITY OF THE UNIT UNDER CALIBRATION.

5. THIS CERTIFICATE IS TRACEABLE TO THE INTERNATIONAL SYSTEM OF UNIT MAINTAINED AT:-  
- NATIONAL INSTITUTE OF METROLOGY (THAILAND) THROUGH QUALITY CALIBRATION CO., LTD.

### RESULT OF CALIBRATION :- WITHOUT ADJUSTMENT



FRONT

#### GENERAL INFORMATION

Overall Ambient Temperature around the Chamber (°C) variation : 2
Overall Line Voltage (V) variation : 2
Instrument Condition : Normal
Chamber Size (W*L*H): 56*40*48 cm

#### CHAMBER PERFORMANCE

Controller Temperature (°C)	Indicating Temperature (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
104.0	104.0	0.09	0.31	0.47
180.0	180.0	0.15	0.59	0.76

#### TEMPERATURE MEASUREMENT ACCURACY TEST

Controller Temp (°C)	Indicating Temp (°C)	Measured Temperature (°C) at Spread Locations									Uncertainty (±°C)
		#1	#2	#3	#4	Ref. 5	#6	#7	#8	#9	
104.0	104.0	104.19	103.99	104.11	104.06	103.81	104.03	103.88	103.85	103.95	0.57
180.0	180.0	180.51	180.10	180.41	180.34	179.99	180.26	179.96	180.13	180.36	1.1

NOTE 1 : THE UNCERTAINTY OF MEASUREMENT EXCLUDED TEMPERATURE UNIFORMITY OF THE CHAMBER.

NOTE 2: LOCATION 5 WAS REFERENCE LOCATION.

NOTE 3 : THIS CALIBRATION WAS CARRIED OUT AT THE CUSTOMER'S PLACE AT LABORATORY AREA.

THE REPORTED UNCERTAINTY OF MEASUREMENT WAS BASED ON A STANDARD UNCERTAINTY MULTIPLIED BY A COVERAGE FACTOR k =2, PROVIDING A LEVEL OF CONFIDENCE APPROXIMATELY 95%.

END OF CALIBRATION REPORT



## Certificate of Calibration

**Certificate No. :** 67-400083-1

**Page : 1 of 2**

**Submitted by :** STS Green Company Limited  
3/23 Moo 5, T. Lad Sawai, A. Lumlukka, Pathumthani 12150

**Equipment :** Temperature controlled enclosure (Oven)  
**Manufacturer :** Memmert **Model :** UFE 500  
**Range :** N/A °C **Resolution :** 0.5 °C  
**Serial No. :** G509.0607 **ID No. :** HOA 03

**Environment :** On site calibration was carried out at the Laboratory, STS Green Company Limited  
**Ambient Temperature :** (29.0 to 30.0) °C  
**Relative Humidity :** (60 to 65) %  
**Line Voltage :** (223.5 to 224.5) V

**Date of Received :** 16 February 2024

**Date of Calibration :** 16 February 2024

**Date of Issue :** 20 February 2024

**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	66-400595-1	26 Apr 2024	National Institute of Metrology Thailand (NIMT)

Approved by :



( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

Certificate No. : 67-400083-1

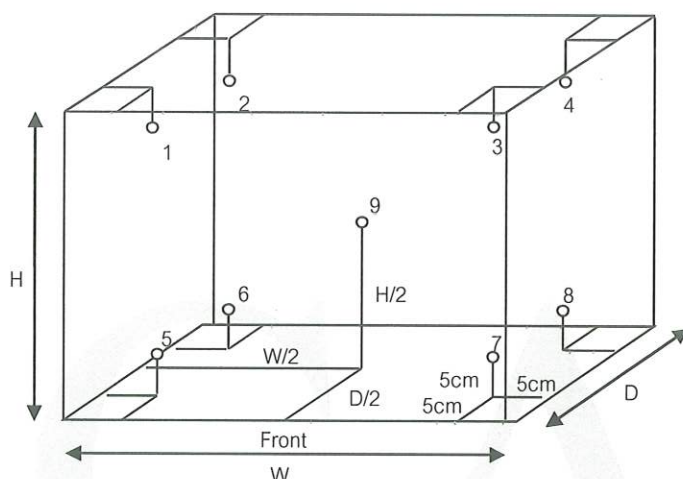
Page : 2 of 2

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 = 0.56 m

D = 0.40 m

H = 0.48 m

Capacity = 0.11 m<sup>3</sup>

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty (± °C)
			1	2	3	4	5	6	7	8	9	
104.0	104.0	104.0	104.2	104.0	104.2	104.2	103.9	103.9	103.8	103.8	103.8	0.80
180.0	180.0	180.0	180.9	180.3	180.6	180.4	180.1	180.1	179.7	179.7	179.7	1.0

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
104.0	104.0	104.0	0.7	0.3	0.8
180.0	180.0	180.0	1.4	0.3	1.6

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. :** 67-400083-3

**Page : 1 of 2**

**Submitted by :** STS Green Company Limited  
3/23 Moo 5, T. Lad Sawai, A. Lumlukka, Pathumthani 12150

**Equipment :** Temperature controlled enclosure (Incubator)  
Manufacturer : Memmert Model : IPP 500  
Range : N/A Resolution : 0.1 °C  
Serial No. : R509.0061 ID No. : COI 01

**Environment :** On site calibration was carried out at the Laboratory, STS Green Company Limited  
Ambient Temperature : (26.0 to 26.5) °C  
Relative Humidity : (60 to 65) %  
Line Voltage : (223.5 to 224.5) V

**Date of Received :** 16 February 2024

**Date of Calibration :** 16 February 2024

**Date of Issue :** 20 February 2024

**Calibrated by :** Permpon Chanpu

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

The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units  
Standard Digital Thermometer with RTD Probe

ID No.	Cert. No.	Due Date	Traceability
400029 & 400043	66-400593-1	25 Apr 2024	National Institute of Metrology Thailand (NIMT)

Approved by :



( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full except with the prior written approval of the Calibratech Co.,Ltd.





## Certificate of Calibration

Certificate No. : 67-400083-3

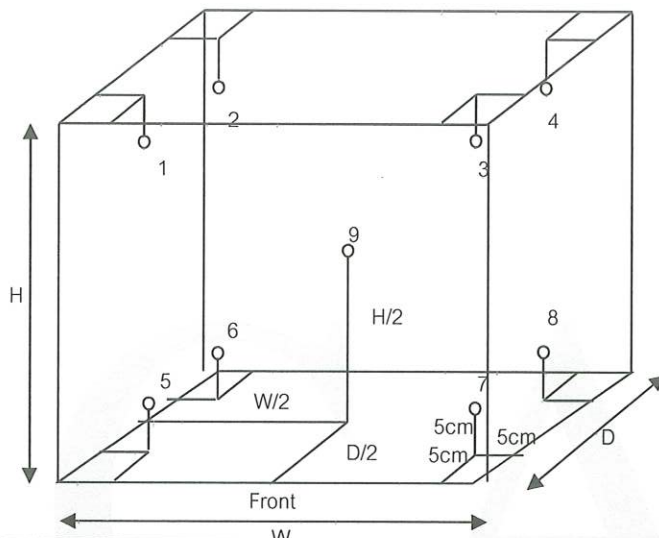
Page : 2 of 2

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 = 0.56 m

D = 0.40 m

H = 0.48 m

Capacity = 0.11 m<sup>3</sup>

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty (± °C)
			1	2	3	4	5	6	7	8	9	
20.0	20.0	20.0	19.68	19.76	19.75	19.80	19.64	19.60	19.96	20.01	19.69	0.30

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
20.0	20.0	20.0	0.34	0.03	0.45

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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