

ภาคผนวก ง

เอกสารสอบเทียบเครื่องมือตรวจวัดคุณภาพสิ่งแวดล้อม

List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Ambient									
1	Sound Level Calibrator (Acoustic Calibrator)	Calibrate Sound Level Meter	Larson Davis	CAL150 6171	Innovative Instrument Co.,Ltd.	24-ACT-086	25 Jun 24	24 Jun 25	-
2	Sound Level Meter	$L_{Aeq} 24 \text{ hrs}$, L_{Amax} , $L_{90\%}$, L_{Adn} เสียงรบกวน	Larson Davis	LxT1 0007301	Electrical And Electronics Institute Foundation For Industrial Development	CP20240286EA	2 Aug 24	1 Aug 25	-
3	Sound Level Meter	$L_{Aeq} 24 \text{ hrs}$, L_{Amax} , $L_{90\%}$, L_{Adn} เสียงรบกวน	Larson Davis	LxT1 0007308	Electrical And Electronics Institute Foundation For Industrial Development	CP20240322EA	22 Aug 24	21 Aug 25	-
4	Sound Level Meter	$L_{Aeq} 24 \text{ hrs}$, L_{Amax} , $L_{90\%}$, L_{Adn} เสียงรบกวน	Larson Davis	LxT1 0007309	Electrical And Electronics Institute Foundation For Industrial Development	CP202340287EA	2 Aug 24	1 Aug 25	-
5	Sound Level Meter	$L_{Aeq} 24 \text{ hrs}$, L_{Amax} , $L_{90\%}$, L_{Adn} เสียงรบกวน	Larson Davis	LxT1 0007310	Electrical And Electronics Institute Foundation For Industrial Development	CP20240289EA	5 Aug 24	4 Aug 25	-
6	Sound Level Meter	$L_{Aeq} 24 \text{ hrs}$, L_{Amax} , $L_{90\%}$, L_{Adn} เสียงรบกวน	Larson Davis	LxT1 0007312	Electrical And Electronics Institute Foundation For Industrial Development	CP20240288EA	5 Aug 24	4 Aug 25	-
7	Sound Level Meter	$L_{Aeq} 24 \text{ hrs}$, L_{Amax} , $L_{90\%}$, L_{Adn} เสียงรบกวน	Larson Davis	LxT1 0007313	Innovative Instrument Co.,Ltd.	24-SLM-039	8 Feb 24	7 Feb 25	-

List of Instruments Certification for Water Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Water									
1	pH Meter	pH	Ecosence	pH100A JC04740	Technology Promotion Association (Thailand-Japan)	24CH311	13 Mar 24	12 Mar 25	-
2	DO Meter	DO	Horiba	LAQUA-DO210 HE2L0040	Technology Promotion Association (Thailand-Japan)	24TW58	13 Mar 24	12 Mar 25	-

List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Workplace									
1	Air Flow Meter	Calibrate personal pump	TSL Inc	4146 41461813030	Innovative Instrument Co., Ltd.	23-AFM-219 Rev.1	25 Oct 23	24 Oct 24	-
2	Aneroid Barometer	Respirable Dust Hydrogen Sulphide Benzene Methanol Toluene Xylene Hexane Mercury	Barigo, Germany	-	Technology Promotion Association (Thailand-Japan)	22P2723	22 Jul 22	21 Jul 23	-
3	Digital Thermo - Hygrometer	Respirable Dust Hydrogen Sulphide Benzene Methanol Toluene Xylene Hexane Mercury	Digitcon	TH-02 395034173	Technology Promotion Association (Thailand-Japan)	23H1099	24 May 23	23 May 24	-
4	Sound Level Calibrator (Acoustic Calibrator)	Calibrate Sound Level Meter	Svantek	SV36 107224	Innovative Instrument Co., Ltd.	23-ACT-117	4 Aug 23	3 Aug 24	-
5	Sound Level Meter	$L_{Aeq} 8 \text{ hrs}$ L_{Amax}	Rion, Japan	NL-42 00408980	Sithiporn Associates Co., Ltd.	ACL24050	18 Jan 24	17 Jan 25	-
6	Sound Level Meter	$L_{Aeq} 8 \text{ hrs}$ L_{Amax}	Rion, Japan	NL-42 00409177	Sithiporn Associates Co., Ltd.	ACL23130	26 Apr 23	25 Apr 24	-
7	Sound Level Meter	$L_{Aeq} 8 \text{ hrs}$ L_{Amax}	Rion, Japan	NL-42 01010786	Sithiporn Associates Co., Ltd.	ACL24103	29 Apr 24	28 Apr 25	-

List of Instruments Certification for Air & Noise Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Workplace									
8	Noise Dosimeter	Noise Dosimeter	Svantek	SV 104IS 128363	Innovative Instrument Co.,Ltd.	23-NDM-089	8 May 23	7 May 24	-
9	Noise Dosimeter	Noise Dosimeter	Svantek	SV 104IS 128431	Innovative Instrument Co.,Ltd.	23-NDM-092	9 May 23	8 May 24	-
10	Noise Dosimeter	Noise Dosimeter	Svantek	SV 104IS 128477	Innovative Instrument Co.,Ltd.	23-NDM-097	9 May 23	8 May 24	-
11	Noise Dosimeter	Noise Dosimeter	Svantek	SV 104IS 128475	Innovative Instrument Co.,Ltd.	23-NDM-096	9 May 23	8 May 24	-
12	Noise Dosimeter	Noise Dosimeter	Svantek	SV 104IS 128474	Innovative Instrument Co.,Ltd.	23-NDM-095	9 May 23	8 May 24	-
13	Digital Lux Meter	Lux	Extech Instrument, Taiwan	407026 A 056653	Innovative Instrument Co., Ltd.	23-LXM-138	20 Apr 23	19 Apr 24	-

Certificate Calibration

Customer: United Analyst and Engineering Consultant Co.,Ltd.
Address: 81 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280
Calibrated by: Ms. Juntapom Kunhakom

Equipment: Sound Level Meter, PCB (Microphone), PCB (Preamplifier)
Model/Type: LxT1 (Meter), 377B02 (Microphone), PRLxT1 (Preamplifier)
Serial No.: 0007301 (Meter), 344263 (Microphone), 077636 (Preamplifier)
ID No.: UAE.EFM.034/2566

Calibration Results

Calibrated: 25 Jul 2024
Received: 25 Jul 2024
Calibrated by: Ms. Juntapom Kunhakom
Reviewed by: Mr. Sittichai Swaksuriyawong
Signature: [Signature]
Date: 25 Jul 2024

Remarks: The equipment is in good condition and meets the requirements for calibration.

Equipment	Model	Serial No.	ID No.	Calibrated by
Sound Level Meter	LxT1	0007301	UAE.EFM.034/2566	Ms. Juntapom Kunhakom
PCB (Microphone)	377B02	344263	UAE.EFM.034/2566	Ms. Juntapom Kunhakom
PCB (Preamplifier)	PRLxT1	077636	UAE.EFM.034/2566	Ms. Juntapom Kunhakom

Signature: [Signature]
Date: 25 Jul 2024

Approved by: [Signature]
Signature: [Signature]
Date: 25 Jul 2024

Signature: [Signature]
Date: 25 Jul 2024

เอกสารไม่ควบคุม

Certificate Calibration

Customer: United Analyst and Engineering Consultant Co.,Ltd.
Address: 81 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280
Calibrated by: Ms. Juntapom Kunhakom

Equipment: Sound Level Meter, PCB (Microphone), PCB (Preamplifier)
Model/Type: LxT1 (Meter), 377B02 (Microphone), PRLxT1 (Preamplifier)
Serial No.: 0007301 (Meter), 344263 (Microphone), 077636 (Preamplifier)
ID No.: UAE.EFM.034/2566

Calibrated: 25 Jul 2024
Received: 25 Jul 2024
Calibrated by: Ms. Juntapom Kunhakom
Reviewed by: Mr. Sittichai Swaksuriyawong
Signature: [Signature]
Date: 25 Jul 2024

Approved by: [Signature]
Signature: [Signature]
Date: 25 Jul 2024

Signature: [Signature]
Date: 25 Jul 2024

เอกสารไม่ควบคุม

Certificate Calibration

Equipment	Model	Serial No.	ID No.	Calibrated by
Sound Level Meter	LxT1	0007301	UAE.EFM.034/2566	Ms. Juntapom Kunhakom
PCB (Microphone)	377B02	344263	UAE.EFM.034/2566	Ms. Juntapom Kunhakom
PCB (Preamplifier)	PRLxT1	077636	UAE.EFM.034/2566	Ms. Juntapom Kunhakom

Equipment	Model	Serial No.	ID No.	Calibrated by
Sound Level Meter	LxT1	0007301	UAE.EFM.034/2566	Ms. Juntapom Kunhakom
PCB (Microphone)	377B02	344263	UAE.EFM.034/2566	Ms. Juntapom Kunhakom
PCB (Preamplifier)	PRLxT1	077636	UAE.EFM.034/2566	Ms. Juntapom Kunhakom

Equipment	Model	Serial No.	ID No.	Calibrated by
Sound Level Meter	LxT1	0007301	UAE.EFM.034/2566	Ms. Juntapom Kunhakom
PCB (Microphone)	377B02	344263	UAE.EFM.034/2566	Ms. Juntapom Kunhakom
PCB (Preamplifier)	PRLxT1	077636	UAE.EFM.034/2566	Ms. Juntapom Kunhakom

Equipment	Model	Serial No.	ID No.	Calibrated by
Sound Level Meter	LxT1	0007301	UAE.EFM.034/2566	Ms. Juntapom Kunhakom
PCB (Microphone)	377B02	344263	UAE.EFM.034/2566	Ms. Juntapom Kunhakom
PCB (Preamplifier)	PRLxT1	077636	UAE.EFM.034/2566	Ms. Juntapom Kunhakom

Signature: [Signature]
Date: 25 Jul 2024

Approved by: [Signature]
Signature: [Signature]
Date: 25 Jul 2024

Signature: [Signature]
Date: 25 Jul 2024

เอกสารไม่ควบคุม



ELECTRICAL AND ELECTRONICS INSTITUTE FOUNDATION FOR INDUSTRIAL DEVELOPMENT

975 Moo 4, Bangpoo Industrial Estate, Soi 8, Sukhumvit Road km 37,
Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280
Tel: +66 2709 4860 Fax: +66 2324 0917



Certificate No.: CP20240286EA
Operation No.: CP2024070249

Certificate of Calibration

Equipment: Sound Level Meter
Manufacturer: Larson Davis (Meter), PCB (Microphone), PCB (Preamplifier)
Model/Type: LxT1 (Meter), 377B02 (Microphone), PRLxT1 (Preamplifier)
Serial No.: 0007301 (Meter), 344263 (Microphone), 077636 (Preamplifier)
ID No.: UAE.EFM.034/2566
Customer: United Analyst and Engineering Consultant Co.,Ltd.
Address: 81 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280
Received Date: 25 July 2024
Calibrated Date: 2 - 5 August 2024
Issued Date: 7 August 2024
Calibrated by: Ms. Juntapom Kunhakom

Approved by: [Signature]
(Mr. Sittichai Swaksuriyawong)
Group Manager

This report was prepared electronically using applicable electronic signature. Printing or copy of file are considered as a copy of the document.

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor (k) providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with the prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.

เอกสารไม่ควบคุม



Certificate No.: CP20240286EA

Calibration Report

Equipment: Sound Level Meter
Manufacturer: Larson Davis (Meter), PCB (Microphone), PCB (Preamplifier)
Model/Type: LxT1 (Meter), 377B02 (Microphone), PRLxT1 (Preamplifier)
Serial No.: 0007301 (Meter), 344263 (Microphone), 077636 (Preamplifier)
ID No.: UAE.EFM.034/2566
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %
Pressure: (101.3 ± 1.5) kPa

Method of Calibration :-
IEC 61672-3:2013.

Condition of this result of calibration

1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2787490	AA-1012-23	12 November 2024
2) Arbitrary Function Generator	AFG2021	C010063	CK20240048EA	23 June 2025
3) Programmable Attenuator	PA5	2755	EF-0040-23	1 October 2024
4) 6.5 Digit precision multimeter	8846A	9610014	CB20230200EA	15 November 2024
5) Pressure humidity and Temperature Transmitter	PTU301	L3950483	CL1-P240023 CD20240142EA	24 March 2025 12 June 2025
6) Pressure humidity and Temperature Transmitter	PTU301	L3950484	CL1-P240030 CD20240143EA	11 April 2025 12 June 2025
7) Performance Audio Analyzer	U8903B	MY56510003	CB20240035EB CK20230072EA	13 February 2025 13 September 2024

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

3. This certification is traceable to the international system of unit maintained at :-

- Reference standards instrument for Acoustic function
- National Institute of Metrology (Thailand)
- Reference standards instrument for Electrical function
- National Institute of Metrology (Thailand)
- Electrical and Electronics Institute; NSC Accredited Calibration No.01119

Result of Calibration:-

Function : 1. Indication at the calibration check frequency

Reference Acoustic Signal (dB)	Measured value (dB)	Deviation (dB)	Acceptance limits (dB)
-	-	-	-

เอกสารไม่ควบคุม



Certificate No.: CP20240286EA

Calibration Report

Function : 2. Self-generated Noise

2.1 Microphone Installed

Measured value (dB)
28.3

2.2 Microphone replaced by the electrical input signal device

Frequency Weighting	Measured value (dB)
A-weighting	28.1
C-weighting	29.5
Z-weighting	33.5

Function : 3. Acoustical signal tests of frequency weightings (Without Windscreen)

Meter free-field acoustic response at a level of 84 dB.

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
125	0.3	0.2	0.2	±1.0
1000	0.0	0.0	0.0	±0.7
8000	-1.4	-1.3	-1.2	+1.5; -2.5

Function : 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
63	-0.1	0.0	0.0	±1.0
125	0.0	0.0	0.0	±1.0
250	-0.1	0.0	0.0	±1.0
500	0.0	0.0	0.0	±1.0
1000	0.0	0.0	0.0	±0.7
2000	0.0	0.0	0.0	±1.0
4000	0.0	0.0	0.0	±1.0
8000	-0.1	0.0	0.0	+1.5; -2.5
16000	0.0	0.0	-0.1	+2.5; -16.0

เอกสารไม่ควบคุม



Certificate No.: CP20240286EA

Calibration Report

Function : 5. Frequency and time weighting at 1 kHz

5.1 Frequency weighting at 1 kHz

Frequency Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
C-weighting	94.0	0.0	±0.2
A-weighting	94.0	0.0	±0.2
Z-weighting	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Time Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
L _{Aeq}	94.0	0.0	±0.1

Function : 6. Long-Term Stability

Long-term stability over 30 minutes, with steady 1 kHz signal at reference level.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
30	94.0	94.0	0.0	±0.1

Function : 7. Level Linearity on the reference level range

7.1 Level Linearity on the reference level range, Upper

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±0.8
99.0	99.0	0.0	±0.8
104.0	104.0	0.0	±0.8
109.0	109.0	0.0	±0.8
114.0	114.0	0.0	±0.8
119.0	119.0	0.0	±0.8
124.0	124.0	0.0	±0.8
129.0	129.0	0.0	±0.8
134.0	134.0	0.0	±0.8
139.0	139.0	0.0	±0.8

เอกสารไม่ควบคุม



Certificate No.: CP20240286EA

Calibration Report

7.2 Level Linearity on the reference level range, Lower

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.1	0.1	±0.8
39.0	39.3	0.3	±0.8

Function : 8. Tone burst response

Time Weighting	Tone burst duration, T _b (ms)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	200	135.9	-0.1	±0.5
	2	118.8	-0.2	+1.0; -1.5
	0.25	109.6	-0.4	+1.0; -3.0
Slow	200	129.5	-0.1	±0.5
	2	109.8	-0.2	+1.0; -3.0
	200	130.0	0.0	±0.5
LAE	2	109.9	-0.1	+1.0; -1.5
	0.25	100.8	-0.2	+1.0; -3.0

Function : 9. Peak C sound level

Number of cycles in test signal	Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Complete cycle	135.4	134.8	-0.6	±2.0
Positive half cycle	134.4	134.0	-0.4	±1.0
Negative half cycle	134.4	134.0	-0.4	±1.0

เอกสารไม่ควบคุม



Certificate No.: CP20240286EA

Calibration Report

Function : 10. Overload indication

Measured value (dB)		Deviated value (dB)	Acceptance limits (dB)
Positive one-half cycle	Negative one-half cycle		
141.8	141.8	0.0	±1.5

Function : 11. High-Level Stability

High-level stability over 5 minutes, with steady 1 kHz signal, 1 dB below upper boundary.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
5	139.0	139.0	0.0	±0.1

Uncertainty of measurement

Function	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1) Indication at the calibration check frequency	0.30	Not applicable
2) Self-generated Noise	0.10	Not applicable
3) Acoustical signal tests of frequency weightings :- Free-field sound pressure response level	0.30	0.60 (10Hz to 4kHz) 0.70 (>4kHz to 10kHz)
4) Electrical signal tests of frequency weightings	0.20	0.20
5) Frequency and time weighting at 1 kHz	0.20	0.20
6) Long-Term Stability	0.10	0.10
7) Level Linearity on the reference level range	0.30	0.30
8) Tone burst response	0.20	0.30
9) Peak C sound level	0.20	0.35
10) Overload indication	0.20	0.25
11) High-Level Stability	0.10	0.10

Remarks: 1. Indication at the calibration check frequency can not measured because customer does not provide a sound calibrator.
2. The acceptance limit is for the deviated value.
3. Acceptance limits was IEC61672-3:2013 Class 1.
4. The coverage factor $k = 2.00$

-- End of Report --

เอกสารไม่ควบคุม



Certificate No.: CP20240322EA
Operation No.: CP2024080293

Certificate of Calibration

Equipment: Sound Level Meter
Manufacturer: Larson Davis (Meter), PCB (Microphone), PCB (Preamplifier)
Model/Type: LxT1 (Meter), 377B02 (Microphone), PRMLxT1 (Preamplifier)
Serial No.: 0007308 (Meter), 345238 (Microphone), 077643 (Preamplifier)
ID No.: UAE.EFM.040/2566
Customer: United Analyst and Engineering Consultant Co.,Ltd.
Address: 81 Soi Udomsuk 41, Sukhumvit Road, Bangchak
Phrakhanong, Bangkok 10260
Received Date: 9 August 2024
Calibrated Date: 22 - 26 August 2024
Issued Date: 28 August 2024
Calibrated by: Ms. Juntapom Kunhakom

Approved by:

(Mr. Sittichai Swaksuriyawong)
Group Manager

This report was prepared electronically using applicable electronic signature. Printing or copy of file are considered as a copy of the document.

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor (k) providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with the prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.

เอกสารไม่ควบคุม



Certificate No.: CP20240322EA

Calibration Report

Equipment: Sound Level Meter
Manufacturer: Larson Davis (Meter), PCB (Microphone), PCB (Preamplifier)
Model/Type: LxT1 (Meter), 377B02 (Microphone), PRMLxT1 (Preamplifier)
Serial No.: 0007308 (Meter), 345238 (Microphone), 077643 (Preamplifier)
ID No.: UAE.EFM.040/2566
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %
Pressure: (101.3 ± 1.5) kPa
Method of Calibration :-
IEC 61672-3:2013.

Condition of this result of calibration

1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2787490	AA-1012-23	12 November 2024
2) Arbitrary Function Generator	AFG2021	C010063	CK20240048EA	23 June 2025
3) Programmable Attenuator	PA5	2755	EF-0040-23	1 October 2024
4) 6.5 Digit precision multimeter	8846A	9610014	CB20230200EA	15 November 2024
5) Pressure humidity and Temperature Transmitter	PTU301	L3950483	CL1-P240023 CD20240142EA	24 March 2025 12 June 2025
6) Pressure humidity and Temperature Transmitter	PTU301	L3950484	CL1-P240030 CD20240143EA	11 April 2025 12 June 2025
7) Performance Audio Analyzer	U8903B	MY56510003	CB20240035EB CK20230072EA	13 February 2025 13 September 2024

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

3. This certification is traceable to the international system of unit maintained at :-

- Reference standards instrument for Acoustic function
- National Institute of Metrology (Thailand)
- Reference standards instrument for Electrical function
- National Institute of Metrology (Thailand)
- Electrical and Electronics Institute; NSC Accredited Calibration No.0119

Result of Calibration:-

Function : 1. Indication at the calibration check frequency

Reference Acoustic Signal (dB)	Measured value (dB)	Deviation (dB)	Acceptance limits (dB)
-	-	-	-

เอกสารไม่ควบคุม



Certificate No.: CP20240322EA

Calibration Report

Function : 2. Self-generated Noise

2.1 Microphone Installed

Measured value (dB)
29.4

2.2 Microphone replaced by the electrical input signal device

Frequency Weighting	Measured value (dB)
A-weighting	29.0
C-weighting	28.9
Z-weighting	35.5

Function : 3. Acoustical signal tests of frequency weightings (Without Windscreen)

Meter free-field acoustic response at a level of 84 dB.

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
125	0.2	0.1	0.2	±1.0
1000	0.3	0.3	0.3	±0.7
8000	-0.6	-0.5	-0.5	+1.5; -2.5

Function : 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
63	-0.1	0.1	0.0	±1.0
125	0.0	0.0	-0.1	±1.0
250	-0.1	0.0	0.0	±1.0
500	0.0	0.0	-0.1	±1.0
1000	0.0	0.0	0.0	±0.7
2000	0.0	0.0	0.0	±1.0
4000	0.0	-0.1	0.0	±1.0
8000	-0.1	-0.1	0.0	+1.5; -2.5
16000	0.0	0.0	-0.1	+2.5; -16.0

เอกสารไม่ควบคุม



Certificate No.: CP20240322EA

Calibration Report

Function : 5. Frequency and time weighting at 1 kHz

5.1 Frequency weighting at 1 kHz

Frequency Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
C-weighting	94.0	0.0	±0.2
A-weighting	94.0	0.0	±0.2
Z-weighting	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Time Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
LAeq	94.0	0.0	±0.1

Function : 6. Long-Term Stability

Long-term stability over 30 minutes, with steady 1 kHz signal at reference level.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
30	94.0	94.0	0.0	±0.1

Function : 7. Level Linearity on the reference level range

7.1 Level Linearity on the reference level range, Upper

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±0.8
99.0	99.0	0.0	±0.8
104.0	104.0	0.0	±0.8
109.0	109.0	0.0	±0.8
114.0	114.0	0.0	±0.8
119.0	119.0	0.0	±0.8
124.0	124.0	0.0	±0.8
129.0	129.0	0.0	±0.8
134.0	134.0	0.0	±0.8
139.0	139.0	0.0	±0.8
140.0	140.0	0.0	±0.8

เอกสารไม่ควบคุม

Page 4 of 6

F-CAL-005 Ed.1



Certificate No.: CP20240322EA

Calibration Report

7.2 Level Linearity on the reference level range, Lower

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.1	0.1	±0.8
39.0	39.4	0.4	±0.8

Function : 8. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	200	135.9	-0.1	±0.5
	2	118.8	-0.2	+1.0 ; -1.5
	0.25	109.6	-0.4	+1.0 ; -3.0
Slow	200	129.5	-0.1	±0.5
	2	109.8	-0.2	+1.0 ; -3.0
	0.25	100.8	-0.2	+1.0 ; -3.0

Function : 9. Peak C sound level

Number of cycles in test signal	Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Complete cycle	135.4	134.8	-0.6	±2.0
Positive half cycle	134.4	134.0	-0.4	±1.0
Negative half cycle	134.4	134.1	-0.3	±1.0

เอกสารไม่ควบคุม

Page 5 of 6

F-CAL-005 Ed.1



Certificate No.: CP20240322EA

Calibration Report

Function : 10. Overload indication

Measured value (dB)		Deviated value (dB)	Acceptance limits (dB)
Positive one-half cycle	Negative one-half cycle		
143.0	142.8	-0.2	±1.5

Function : 11. High-Level Stability

High-level stability over 5 minutes, with steady 1 kHz signal, 1 dB below upper boundary.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
5	139.0	139.0	0.0	±0.1

Uncertainty of measurement

Function	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1) Indication at the calibration check frequency	0.30	Not applicable
2) Self-generated Noise	0.10	Not applicable
3) Acoustical signal tests of frequency weightings :- Free-field sound pressure response level	0.30	0.60 (10Hz to 4kHz) 0.70 (>4kHz to 10kHz)
4) Electrical signal tests of frequency weightings	0.20	0.20
5) Frequency and time weighting at 1 kHz	0.20	0.20
6) Long-Term Stability	0.10	0.10
7) Level Linearity on the reference level range	0.30	0.30
8) Tone burst response	0.20	0.30
9) Peak C sound level	0.20	0.35
10) Overload indication	0.20	0.25
11) High-Level Stability	0.10	0.10

- Remarks:
1. Indication at the calibration check frequency can not measured because customer does not provide a sound calibrator.
 2. The acceptance limit is for the deviated value.
 3. Acceptance limits was IEC61672-3:2013 Class 1.
 4. The coverage factor $k = 2.00$

-- End of Report --

เอกสารไม่ควบคุม

Page 6 of 6

F-CAL-005 Ed.1



Certificate No.: CP20240287EA

Operation No.: CP2024070250

Certificate of Calibration

Equipment: Sound Level Meter

Manufacturer: Larson Davis (Meter), PCB (Microphone), PCB (Preamplifier)

Model/Type: LxT1 (Meter), 377B02 (Microphone), PRLxT1 (Preamplifier)

Serial No.: 0007309 (Meter), 345239 (Microphone), 077644 (Preamplifier)

ID No.: UAE.EFM.041/2566

Customer: United Analyst and Engineering Consultant Co.,Ltd.

Address: 81 Soi Udomsuk 41, Sukhumvit Road, Bangchak Phrakhanong, Bangkok 10260

Received Date: 25 July 2024

Calibrated Date: 2 - 5 August 2024

Issued Date: 7 August 2024

Calibrated by: Ms. Juntapom Kunhakom

Approved by:

(Mr. Sittichai Swaksuriyawong)

Group Manager

This report was prepared electronically using applicable electronic signature. Printing or copy of file are considered as a copy of the document.

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor (k) providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with the prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.

Page 1 of 6

เอกสารไม่ควบคุม

F-CAL-004 Ed.1



Certificate No.: CP20240287EA

Calibration Report

Equipment: Sound Level Meter
Manufacturer: Larson Davis (Meter), PCB (Microphone), PCB (Preamplifier)
Model/Type: LxT1 (Meter), 377B02 (Microphone), PRMLxT1 (Preamplifier)
Serial No.: 0007309 (Meter), 345239 (Microphone), 077644 (Preamplifier)
ID No.: UAEFFM.041/2566
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %
Pressure: (101.3 ± 1.5) kPa

Method of Calibration :-
IEC 61672-3:2013.

Condition of this result of calibration

1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2787490	AA-1012-23	12 November 2024
2) Arbitrary Function Generator	AFG2021	C010063	CK20240048EA	23 June 2025
3) Programmable Attenuator	PA5	2755	EF-0040-23	1 October 2024
4) 6.5 Digit precision multimeter	8846A	9610014	CB20230200EA	15 November 2024
5) Pressure humidity and Temperature Transmitter	PTU301	L3950483	CL1-P240023 CD20240142EA	24 March 2025 12 June 2025
6) Pressure humidity and Temperature Transmitter	PTU301	L3950484	CL1-P240030 CD20240143EA	11 April 2025 12 June 2025
7) Performance Audio Analyzer	U8903B	MY56510003	CB20240035EB CK20230072EA	13 February 2025 13 September 2024

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

3. This certification is traceable to the international system of unit maintained at :-

- Reference standards instrument for Acoustic function
- National Institute of Metrology (Thailand)
- Reference standards instrument for Electrical function
- National Institute of Metrology (Thailand)
- Electrical and Electronics Institute; NSC Accredited Calibration No.01119

Result of Calibration:-

Function : 1. Indication at the calibration check frequency

Reference Acoustic Signal (dB)	Measured value (dB)	Deviation (dB)	Acceptance limits (dB)
-	-	-	-

เอกสารไม่ควบคุม



Certificate No.: CP20240287EA

Calibration Report

Function : 2. Self-generated Noise

2.1 Microphone Installed

Measured value (dB)
30.5

2.2 Microphone replaced by the electrical input signal device

Frequency Weighting	Measured value (dB)
A-weighting	29.5
C-weighting	29.5
Z-weighting	35.5

Function : 3. Acoustical signal tests of frequency weightings (Without Windscreen)

Meter free-field acoustic response at a level of 84 dB.

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
125	0.4	0.3	0.4	±1.0
1000	0.1	0.1	0.1	±0.7
8000	-1.6	-1.6	-1.6	+1.5; -2.5

Function : 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
63	0.0	0.0	0.0	±1.0
125	0.0	0.0	-0.1	±1.0
250	0.0	0.0	-0.1	±1.0
500	0.0	0.0	-0.1	±1.0
1000	0.0	0.0	0.0	±0.7
2000	0.0	0.0	-0.1	±1.0
4000	0.0	0.0	-0.1	±1.0
8000	-0.1	-0.1	0.0	+1.5; -2.5
16000	0.0	0.0	-0.1	+2.5; -16.0

เอกสารไม่ควบคุม



Certificate No.: CP20240287EA

Calibration Report

Function : 5. Frequency and time weighting at 1 kHz

5.1 Frequency weighting at 1 kHz

Frequency Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
C-weighting	94.0	0.0	±0.2
A-weighting	94.0	0.0	±0.2
Z-weighting	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Time Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
L _{Aeq}	94.0	0.0	±0.1

Function : 6. Long-Term Stability

Long-term stability over 30 minutes, with steady 1 kHz signal at reference level.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
30	94.0	94.0	0.0	±0.1

Function : 7. Level Linearity on the reference level range

7.1 Level Linearity on the reference level range, Upper

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±0.8
99.0	99.0	0.0	±0.8
104.0	104.0	0.0	±0.8
109.0	109.0	0.0	±0.8
114.0	114.0	0.0	±0.8
119.0	119.0	0.0	±0.8
124.0	124.0	0.0	±0.8
129.0	129.0	0.0	±0.8
134.0	134.0	0.0	±0.8
139.0	139.0	0.0	±0.8
140.0	140.0	0.0	±0.8

เอกสารไม่ควบคุม



Certificate No.: CP20240287EA

Calibration Report

7.2 Level Linearity on the reference level range, Lower

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.1	0.1	±0.8
39.0	39.4	0.4	±0.8

Function : 8. Tone burst response

Time Weighting	Tone burst duration, T _b (ms)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	200	136.0	0.0	±0.5
	2	118.9	-0.1	+1.0; -1.5
	0.25	109.8	-0.2	+1.0; -3.0
Slow	200	129.5	-0.1	±0.5
	2	109.9	-0.1	+1.0; -3.0
	200	130.0	0.0	±0.5
LAE	2	110.1	0.1	+1.0; -1.5
	0.25	101.0	0.0	+1.0; -3.0

Function : 9. Peak C sound level

Number of cycles in test signal	Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Complete cycle	135.4	134.8	-0.6	±2.0
Positive half cycle	134.4	134.0	-0.4	±1.0
Negative half cycle	134.4	134.0	-0.4	±1.0

เอกสารไม่ควบคุม



Certificate No.: CP20240287EA

Calibration Report

Function : 10. Overload indication

Measured value (dB)		Deviated value (dB)	Acceptance limits (dB)
Positive one-half cycle	Negative one-half cycle		
144.3	144.2	-0.1	±1.5

Function : 11. High-Level Stability

High-level stability over 5 minutes, with steady 1 kHz signal, 1 dB below upper boundary.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
5	139.0	139.0	0.0	±0.1

Uncertainty of measurement

Function	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1) Indication at the calibration check frequency	0.30	Not applicable
2) Self-generated Noise	0.10	Not applicable
3) Acoustical signal tests of frequency weightings :- Free-field sound pressure response level	0.30	0.60 (10Hz to 4kHz) 0.70 (>4kHz to 10kHz)
4) Electrical signal tests of frequency weightings	0.20	0.20
5) Frequency and time weighting at 1 kHz	0.20	0.20
6) Long-Term Stability	0.10	0.10
7) Level Linearity on the reference level range	0.30	0.30
8) Tone burst response	0.20	0.30
9) Peak C sound level	0.20	0.35
10) Overload indication	0.20	0.25
11) High-Level Stability	0.10	0.10

Remarks: 1. Indication at the calibration check frequency can not measured because customer does not provide a sound calibrator.
2. The acceptance limit is for the deviated value.
3. Acceptance limits was IEC61672-3:2013 Class 1.
4. The coverage factor $k = 2.00$

-- End of Report --

เอกสารไม่ควบคุม



Certificate No.: CP20240289EA

Operation No.: CP2024070252

Certificate of Calibration

Equipment: Sound Level Meter

Manufacturer: Larson Davis (Meter), PCB (Microphone), PCB (Preamplifier)

Model/Type: LxT1 (Meter), 377B02 (Microphone), PRMLxT1 (Preamplifier)

Serial No.: 0007310 (Meter), 345240 (Microphone), 077645 (Preamplifier)

ID No.: UAE.EFM.042/2566

Customer: United Analyst and Engineering Consultant Co.,Ltd.

Address: 81 Soi Udomsuk 41, Sukhumvit Road, Bangchak
Phrakhanong, Bangkok 10260

Received Date: 25 July 2024

Calibrated Date: 5 - 6 August 2024

Issued Date: 7 August 2024

Calibrated by: Ms. Juntapom Kunhakom

Approved by:

(Mr. Sittichai Swaksuriyawong)
Group Manager

This report was prepared electronically using applicable electronic signature. Printing or copy of file are considered as a copy of the document.

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor (k) providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with the prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.

เอกสารไม่ควบคุม



Certificate No.: CP20240289EA

Calibration Report

Equipment: Sound Level Meter
Manufacturer: Larson Davis (Meter), PCB (Microphone), PCB (Preamplifier)
Model/Type: LxT1 (Meter), 377B02 (Microphone), PRMLxT1 (Preamplifier)
Serial No.: 0007310 (Meter), 345240 (Microphone), 077645 (Preamplifier)
ID No.: UAE.EFM.042/2566
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %
Pressure: (101.3 ± 1.5) kPa
Method of Calibration :-
IEC 61672-3:2013.

Condition of this result of calibration

1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2787490	AA-1012-23	12 November 2024
2) Arbitrary Function Generator	AFG2021	C010063	CK20240048EA	23 June 2025
3) Programmable Attenuator	PA5	2755	EF-0040-23	1 October 2024
4) 6.5 Digit precision multimeter	8846A	9610014	CB20230200EA	15 November 2024
5) Pressure humidity and Temperature Transmitter	PTU301	L3950483	CL1-P240023 CD20240142EA	24 March 2025 12 June 2025
6) Pressure humidity and Temperature Transmitter	PTU301	L3950484	CL1-P240030 CD20240143EA	11 April 2025 12 June 2025
7) Performance Audio Analyzer	U8903B	MY56510003	CB20240035EB CK20230072EA	13 February 2025 13 September 2024

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

3. This certification is traceable to the international system of unit maintained at :-

- Reference standards instrument for Acoustic function
 - National Institute of Metrology (Thailand)
- Reference standards instrument for Electrical function
 - National Institute of Metrology (Thailand)
 - Electrical and Electronics Institute; NSC Accredited Calibration No.0119

Result of Calibration:-

Function : 1. Indication at the calibration check frequency

Reference Acoustic Signal (dB)	Measured value (dB)	Deviation (dB)	Acceptance limits (dB)
-	-	-	-

เอกสารไม่ควบคุม



Certificate No.: CP20240289EA

Calibration Report

Function : 2. Self-generated Noise

2.1 Microphone Installed

Measured value (dB)
30.3

2.2 Microphone replaced by the electrical input signal device

Frequency Weighting (Hz)	Measured value (dB)
A-weighting	30.1
C-weighting	30.0
Z-weighting	35.7

Function : 3. Acoustical signal tests of frequency weightings (Without Windscreen)

Meter free-field acoustic response at a level of 84 dB.

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
125	0.3	0.2	0.3	±1.0
1000	0.2	0.2	0.2	±0.7
8000	-0.2	-0.1	-0.1	+1.5; -2.5

Function : 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
63	-0.1	0.1	0.0	±1.0
125	0.0	0.0	0.0	±1.0
250	0.0	0.0	0.0	±1.0
500	0.0	0.0	0.0	±1.0
1000	0.0	0.0	0.0	±0.7
2000	0.0	0.1	0.0	±1.0
4000	0.0	0.0	0.0	±1.0
8000	-0.1	0.0	0.0	+1.5; -2.5
16000	0.0	0.0	-0.1	+2.5; -16.0

เอกสารไม่ควบคุม



Certificate No.: CP20240289EA

Calibration Report

Function : 5. Frequency and time weighting at 1 kHz

5.1 Frequency weighting at 1 kHz

Frequency Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
C-weighting	94.0	0.0	±0.2
A-weighting	94.0	0.0	±0.2
Z-weighting	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Time Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
LAeq	94.0	0.0	±0.1

Function : 6. Long-Term Stability

Long-term stability over 30 minutes, with steady 1 kHz signal at reference level.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
30	94.0	94.0	0.0	±0.1

Function : 7. Level Linearity on the reference level range

7.1 Level Linearity on the reference level range, Upper

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±0.8
99.0	99.0	0.0	±0.8
104.0	104.0	0.0	±0.8
109.0	109.0	0.0	±0.8
114.0	114.0	0.0	±0.8
119.0	119.0	0.0	±0.8
124.0	124.0	0.0	±0.8
129.0	129.0	0.0	±0.8
134.0	134.0	0.0	±0.8
139.0	139.0	0.0	±0.8
140.0	140.0	0.0	±0.8
141.0	141.0	0.0	±0.8

เอกสารไม่ควบคุม

Page 4 of 6

F-CAL-005 Ed.1



Certificate No.: CP20240289EA

Calibration Report

7.2 Level Linearity on the reference level range, Lower

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.1	0.1	±0.8
39.0	39.4	0.4	±0.8

Function : 8. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	200	135.9	-0.1	±0.5
	2	118.8	-0.2	+1.0 ; -1.5
	0.25	109.8	-0.2	+1.0 ; -3.0
Slow	200	129.5	-0.1	±0.5
	2	109.9	-0.1	+1.0 ; -3.0
	0.25	100.9	-0.1	+1.0 ; -3.0

Function : 9. Peak C sound level

Number of cycles in test signal	Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Complete cycle	135.4	134.8	-0.6	±2.0
Positive half cycle	134.4	134.0	-0.4	±1.0
Negative half cycle	134.4	134.0	-0.4	±1.0

เอกสารไม่ควบคุม

Page 5 of 6

F-CAL-005 Ed.1



Certificate No.: CP20240289EA

Calibration Report

Function : 10. Overload indication

Measured value (dB)		Deviated value (dB)	Acceptance limits (dB)
Positive one-half cycle	Negative one-half cycle		
144.3	144.2	-0.1	±1.5

Function : 11. High-Level Stability

High-level stability over 5 minutes, with steady 1 kHz signal, 1 dB below upper boundary.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
5	139.0	139.0	0.0	±0.1

Uncertainty of measurement

Function	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1) Indication at the calibration check frequency	0.30	Not applicable
2) Self-generated Noise	0.10	Not applicable
3) Acoustical signal tests of frequency weightings :- Free-field sound pressure response level	0.30	0.60 (10Hz to 4kHz) 0.70 (>4kHz to 10kHz)
4) Electrical signal tests of frequency weightings	0.20	0.20
5) Frequency and time weighting at 1 kHz	0.20	0.20
6) Long-Term Stability	0.10	0.10
7) Level Linearity on the reference level range	0.30	0.30
8) Tone burst response	0.20	0.30
9) Peak C sound level	0.20	0.35
10) Overload indication	0.20	0.25
11) High-Level Stability	0.10	0.10

- Remarks:
1. Indication at the calibration check frequency can not measured because customer does not provide a sound calibrator.
 2. The acceptance limit is for the deviated value.
 3. Acceptance limits was IEC61672-3:2013 Class 1.
 4. The coverage factor $k = 2.00$

-- End of Report --

เอกสารไม่ควบคุม

Page 6 of 6

F-CAL-005 Ed.1



Certificate No.: CP20240288EA

Operation No.: CP2024070251

Certificate of Calibration

Equipment: Sound Level Meter

Manufacturer: Larson Davis (Meter), PCB (Microphone), PCB (Preamplifier)

Model/Type: LxT1 (Meter), 377B02 (Microphone), PRLxT1 (Preamplifier)

Serial No.: 0007312 (Meter), 345818 (Microphone), 077647 (Preamplifier)

ID No.: UAE.EFM.044/2566

Customer: United Analyst and Engineering Consultant Co.,Ltd.

Address: 81 Soi Udomsuk 41, Sukhumvit Road, Bangchak Phrakhanong, Bangkok 10260

Received Date: 25 July 2024

Calibrated Date: 5 - 6 August 2024

Issued Date: 7 August 2024

Calibrated by: Ms. Juntapom Kunhakom

Approved by:

(Mr. Sittichai Swaksuriyawong)

Group Manager

This report was prepared electronically using applicable electronic signature. Printing or copy of file are considered as a copy of the document.

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor (k) providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with the prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.

Page 1 of 6

เอกสารไม่ควบคุม

F-CAL-004 Ed.1



Certificate No.: CP20240288EA

Calibration Report

Equipment: Sound Level Meter
Manufacturer: Larson Davis (Meter), PCB (Microphone), PCB (Preamplifier)
Model/Type: LxT1 (Meter), 377B02 (Microphone), PRMLxT1 (Preamplifier)
Serial No.: 0007312 (Meter), 345818 (Microphone), 077647 (Preamplifier)
ID No.: UAEFFM.044/2566
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %
Pressure: (101.3 ± 1.5) kPa

Method of Calibration :-
IEC 61672-3:2013.

Condition of this result of calibration

1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2787490	AA-1012-23	12 November 2024
2) Arbitrary Function Generator	AFG2021	C010063	CK20240048EA	23 June 2025
3) Programmable Attenuator	PA5	2755	EF-0040-23	1 October 2024
4) 6.5 Digit precision multimeter	8846A	9610014	CB20230200EA	15 November 2024
5) Pressure humidity and Temperature Transmitter	PTU301	L3950483	CL1-P240023 CD20240142EA	24 March 2025 12 June 2025
6) Pressure humidity and Temperature Transmitter	PTU301	L3950484	CL1-P240030 CD20240143EA	11 April 2025 12 June 2025
7) Performance Audio Analyzer	U8903B	MY56510003	CB20240035EB CK20230072EA	13 February 2025 13 September 2024

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

3. This certification is traceable to the international system of unit maintained at :-

- Reference standards instrument for Acoustic function
- National Institute of Metrology (Thailand)
- Reference standards instrument for Electrical function
- National Institute of Metrology (Thailand)
- Electrical and Electronics Institute; NSC Accredited Calibration No.01119

Result of Calibration:-

Function : 1. Indication at the calibration check frequency

Reference Acoustic Signal (dB)	Measured value (dB)	Deviation (dB)	Acceptance limits (dB)
-	-	-	-

เอกสารไม่ควบคุม



Certificate No.: CP20240288EA

Calibration Report

Function : 2. Self-generated Noise

2.1 Microphone Installed

Measured value (dB)
28.5

2.2 Microphone replaced by the electrical input signal device

Frequency Weighting	Measured value (dB)
A-weighting	28.4
C-weighting	28.3
Z-weighting	34.1

Function : 3. Acoustical signal tests of frequency weightings (Without Windscreen)

Meter free-field acoustic response at a level of 84 dB.

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
125	0.2	0.1	0.1	±1.0
1000	0.0	0.0	0.0	±0.7
8000	-0.9	-0.9	-0.8	+1.5; -2.5

Function : 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various Frequency Weighting Response Curve			
	C-Weighting (dB)	A-Weighting (dB)	Z-Weighting (dB)	Acceptance limits (dB)
63	0.0	0.1	0.0	±1.0
125	0.0	0.0	0.0	±1.0
250	0.0	0.0	0.0	±1.0
500	0.0	-0.1	0.0	±1.0
1000	0.0	0.0	0.0	±0.7
2000	0.0	0.0	0.0	±1.0
4000	0.0	0.0	0.0	±1.0
8000	-0.1	0.0	0.0	+1.5; -2.5
16000	0.0	0.0	-0.1	+2.5; -16.0

เอกสารไม่ควบคุม



Certificate No.: CP20240288EA

Calibration Report

Function : 5. Frequency and time weighting at 1 kHz

5.1 Frequency weighting at 1 kHz

Frequency Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
C-weighting	94.0	0.0	±0.2
A-weighting	94.0	0.0	±0.2
Z-weighting	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Time Weighting	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	94.0	0.0	±0.1
Slow	94.0	0.0	±0.1
LAeq	94.0	0.0	±0.1

Function : 6. Long-Term Stability

Long-term stability over 30 minutes, with steady 1 kHz signal at reference level.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
30	94.0	94.0	0.0	±0.1

Function : 7. Level Linearity on the reference level range

7.1 Level Linearity on the reference level range, Upper

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±0.8
99.0	99.0	0.0	±0.8
104.0	104.0	0.0	±0.8
109.0	109.0	0.0	±0.8
114.0	114.0	0.0	±0.8
119.0	119.0	0.0	±0.8
124.0	124.0	0.0	±0.8
129.0	129.0	0.0	±0.8
134.0	134.0	0.0	±0.8
139.0	139.0	0.0	±0.8

เอกสารไม่ควบคุม



Certificate No.: CP20240288EA

Calibration Report

7.2 Level Linearity on the reference level range, Lower

Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.1	0.1	±0.8
39.0	39.3	0.3	±0.8

Function : 8. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Fast	200	136.0	0.0	±0.5
	2	118.8	-0.2	+1.0; -1.5
	0.25	109.7	-0.3	+1.0; -3.0
Slow	200	129.5	-0.1	±0.5
	2	109.9	-0.1	+1.0; -3.0
	200	130.0	0.0	±0.5
LAE	2	110.0	0.0	+1.0; -1.5
	0.25	100.9	-0.1	+1.0; -3.0

Function : 9. Peak C sound level

Number of cycles in test signal	Anticipated Value (dB)	Measured value (dB)	Deviated value (dB)	Acceptance limits (dB)
Complete cycle	135.4	134.8	-0.6	±2.0
Positive half cycle	134.4	134.0	-0.4	±1.0
Negative half cycle	134.4	134.0	-0.4	±1.0

เอกสารไม่ควบคุม



Certificate No.: CP20240288EA

Calibration Report

Function : 10. Overload indication

Measured value (dB)		Deviated value (dB)	Acceptance limits (dB)
Positive one-half cycle	Negative one-half cycle		
142.4	142.3	-0.1	±1.5

Function : 11. High-Level Stability

High-level stability over 5 minutes, with steady 1 kHz signal, 1 dB below upper boundary.

Time Period to Apply Signal (min)	Reference SPL (dB)	Record SPL at Conclusion of Time Period (dB)	Deviated value (dB)	Acceptance limits (dB)
5	139.0	139.0	0.0	±0.1

Uncertainty of measurement

Function	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1) Indication at the calibration check frequency	0.30	Not applicable
2) Self-generated Noise	0.10	Not applicable
3) Acoustical signal tests of frequency weightings - Free-field sound pressure response level	0.30	0.60 (10Hz to 4kHz) 0.70 (>4kHz to 10kHz)
4) Electrical signal tests of frequency weightings	0.20	0.20
5) Frequency and time weighting at 1 kHz	0.20	0.20
6) Long-Term Stability	0.10	0.10
7) Level Linearity on the reference level range	0.30	0.30
8) Tone burst response	0.20	0.30
9) Peak C sound level	0.20	0.35
10) Overload indication	0.20	0.25
11) High-Level Stability	0.10	0.10

- Remarks:
1. Indication at the calibration check frequency can not measured because customer does not provide a sound calibrator.
 2. The acceptance limit is for the deviated value.
 3. Acceptance limits was IEC61672-3:2013 Class 1.
 4. The coverage factor $k = 2.00$

-- End of Report --

เอกสารไม่ควบคุม

Calibration Certificate

Customer: ...
Product: ...
Model: ...
Serial: ...
Date: ...
By: ...
For: ...
Remarks: ...

Item	Value	Unit	Reference	Acceptance
1. Frequency	1000	Hz	1000	±0.1
2. Level	139.0	dB	139.0	±0.1
3. Stability	0.0	dB	0.0	±0.1

Signature: ...
Date: ...
Signature: ...
Date: ...

เอกสารไม่ควบคุม

Customer: ...
Product: ...
Model: ...
Serial: ...
Date: ...
By: ...
For: ...
Remarks: ...

Item	Value	Unit	Reference	Acceptance
1. Frequency	1000	Hz	1000	±0.1
2. Level	139.0	dB	139.0	±0.1
3. Stability	0.0	dB	0.0	±0.1

Signature: ...
Date: ...
Signature: ...
Date: ...

เอกสารไม่ควบคุม

Category	Sub-category	Value	Unit
Energy	Electricity	1000	kWh
	Gas	500	m³
	Water	200	m³
	Heating	150	kWh
	Cooling	100	kWh
Transport	Car	100	km
	Bus	50	km
	Train	20	km

2012 Starting Balance, 12/31/11	Additions	Deductions		2012 Ending Balance, 12/31/12	Percent Change
		141	149		
21444	446	446	446		
13000	37	130	130	2.1	15%
11000	37	100	100	2.7	24%
10000	37	100	100	3.7	37%
10000	37	100	100	4.7	47%
10000	37	100	100	5.7	57%
10000	37	100	100	6.7	67%
10000	37	100	100	7.7	77%
10000	37	100	100	8.7	87%
10000	37	100	100	9.7	97%
10000	37	100	100	10.7	107%
10000	37	100	100	11.7	117%
10000	37	100	100	12.7	127%
10000	37	100	100	13.7	137%
10000	37	100	100	14.7	147%
10000	37	100	100	15.7	157%
10000	37	100	100	16.7	167%
10000	37	100	100	17.7	177%
10000	37	100	100	18.7	187%
10000	37	100	100	19.7	197%
10000	37	100	100	20.7	207%
10000	37	100	100	21.7	217%
10000	37	100	100	22.7	227%
10000	37	100	100	23.7	237%
10000	37	100	100	24.7	247%
10000	37	100	100	25.7	257%
10000	37	100	100	26.7	267%
10000	37	100	100	27.7	277%
10000	37	100	100	28.7	287%
10000	37	100	100	29.7	297%
10000	37	100	100	30.7	307%
10000	37	100	100	31.7	317%
10000	37	100	100	32.7	327%
10000	37	100	100	33.7	337%
10000	37	100	100	34.7	347%
10000	37	100	100	35.7	357%
10000	37	100	100	36.7	367%
10000	37	100	100	37.7	377%
10000	37	100	100	38.7	387%
10000	37	100	100	39.7	397%
10000	37	100	100	40.7	407%
10000	37	100	100	41.7	417%
10000	37	100	100	42.7	427%
10000	37	100	100	43.7	437%
10000	37	100	100	44.7	447%
10000	37	100	100	45.7	457%
10000	37	100	100	46.7	467%
10000	37	100	100	47.7	477%
10000	37	100	100	48.7	487%
10000	37	100	100	49.7	497%
10000	37	100	100	50.7	507%
10000	37	100	100	51.7	517%
10000	37	100	100	52.7	527%
10000	37	100	100	53.7	537%
10000	37	100	100	54.7	547%
10000	37	100	100	55.7	557%
10000	37	100	100	56.7	567%
10000	37	100	100	57.7	577%
10000	37	100	100	58.7	587%
10000	37	100	100	59.7	597%
10000	37	100	100	60.7	607%
10000	37	100	100	61.7	617%
10000	37	100	100	62.7	627%
10000					

เอกสารไม่ควบคุม

Variable	N	Frequency		Percentage	Cumulative Percentage
		Observed	Expected		
1. Yes	10	10	10	100.0	100.0
2. No	0	0	0	0.0	0.0
Total	10	10	10	100.0	100.0

[illegible][illegible]

เอกสารไม่ควบคุม

[illegible][illegible][illegible]

電話 06-6341-1111 傳真 06-6341-1112

เอกสารไม่ควบคุม

Equipment :	pH Meter
Manufacturer :	EcoSense
Model :	pH100A
Serial No. :	JC04740
ID No. :	UAE_EFM_062/2566(EFM,pH.05/66)
Condition As-Received:	Used Item
Received Date :	12 March 2024
Calibration Date :	13 March 2024
Reference :	2403-0386WSC-4
Submitted by :	United Analyst and Engineering Consultant Co.,Ltd. 3 Soi Udomsuk 41, Sukhumvit Road, Bangchak Phrakhanong, Bangkok 10260

Ambient Temperature : (25 $\pm$ 2.5) °C
Relative Humidity : (50 $\pm$ 15) %
Calibration Procedure : In-house method

- CP-CH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with temperature standard

Calibrated by : Warakorn Lemgagtrakul

Approved by _____
Approved Signature

☐ Pornthippa Tameyakul
☐ Unnopphol Harachai
☒ Saithip Meangmai

Issue Date : 15 March 2024

The Uncertainties are for a confidence probability of approximately 95%

เอกสารไม่ควบคุม



Cert.No.: 24CH311
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	23E2802	27 Aug 2024
2) Ref. Standard Thermometer	4982054	110RC044	23I908	26 July 2024

This certification is traceable to the International System of Unit maintained through:-

Technology Promotion Association (Thailand-Japan)

2. Certified Reference Materials

The measurement results are traceable to SI through CPA chem Ltd.,
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.008	CPA chem	940102	27 Nov 2025
pH 6.986	CPA chem	940104	02 Nov 2024
pH 9.997	CPA chem	940106	02 Nov 2024

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration Results

Function: mV Measurement

Performing standard curve by Document Process Calibrator at pH (4.7)(7.10)

Performing standard curve by Document Process Calculator at pH (4,7,10)						
Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement	Coverage factor
	pH	mV	mV	pH	(±mV)	k
pH Meter S/N.: JC04740	4.00	177.48	177	4.01	0.58	2.00
	7.00	0.00	0	7.00	0.58	2.00
	7.00	0.00	0	7.00	0.58	2.00
	10.00	177.48	177	10.01	0.58	2.00

เอกสารไม่ควบคุม

a 1206339



Cert.No.: 24CH311
Page.: 3 of 3

Calibration Results

Function: pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4.7)(7.10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement ($\pm$)	Coverage factor k
pH Electrode S/N.: 230906SIA805377	4.008	4.01	172	0.0071	2.00
	6.986	7.00	-2	0.0099	2.00
	6.986	7.00	-2	0.011	2.00
	9.997	10.01	-177	0.0096	2.00

Function: Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model

- Serial No. 230906SIA805377

Dimension of probe

- Length: 110 mm

- Diameter: 12 mm

Immersion Depth: 100 mm

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement ($\pm$ °C)	Coverage factor k
25.0	25.004	24.9	-0.104	0.13	2.00
30.0	30.002	29.9	-0.102	0.13	2.00
35.0	35.002	34.9	-0.102	0.13	2.00

Remark: *UUC* = Unit Under Calibration

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

-o0o-

เอกสารไม่ควบคุม

n 1206340



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL: 0-2717-3000 FAX: 0-2719-9484

Cert.No.: 24TW58
Page.: 1 of 2

Certificate of Testing

Equipment : DO Meter
Manufacturer : Horiba
Model : LAQUA-DC210
Serial No. : HE2L0040
ID No. : UAE EFM.017/2586(EFM.DO.02/66)
Received Date : 12 March 2024
Test Date : 13 March 2024
Reference : 2403-0385WSC-6
Submitted by : United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10250
Laboratory Condition : Temperature (25 $\pm$ 5) °C
Humidity (50 $\pm$ 20) %
Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method

Tested by : Walalak Sirifrean

Approved by :
Approved Signatory

() Pornthippa Tameyakul
() Unnopphol Harachai
✓ Sathip Meangmai

Issue Date : 15 March 2024

เอกสารไม่ควบคุม



Cert.No.: 24TW58
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments

This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1. Burette	-	130BU10	23CG1172	22 Mar 2025
2. Balance	14233821	110RC001	23MM405	16 July 2024

2. Standard Material :-

Material	Manufacturer	Lot No.	Assay
Sodium Thiosulfate pentahydrate	Merck	AM1763316	100.2%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 9K2L0010

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.18	8.19	0.0045

This report was certified only for the instrument we tested it is allowable to use for study
Intend to use for advertising and referral purpose is prohibited. This report may not be reproduced
other in full without written approval of the laboratory

-o0o-

เอกสารไม่ควบคุม



Cert. No.: 24LM43
Page.: 1 of 2

Certificate of Calibration

Equipment : DO Meter With Sensor
Manufacturer : Horiba
Model : LAQUA-DO210
Serial No. : HE2L0040
ID No. : UAE.EFM.017/2566(EFM.DO.02/66)
Submitted by : United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak Phrakhanong,
Bangkok 10260
Location : TPA Chemistry Calibration Laboratory
Received Order : 12 March 2024
Calibrated Date : 14 March 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V
Calibrated by : Preecha Hlanib
Approved by :
() Pornthippa Tameyakul
() Unnopphol Harachai
(x) Suwit Imjai
Issue Date : 29 March 2024

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 head of Corporate Services 3: Equipment Calibration and Testing Services.

เอกสารไม่ควบคุม



Equipment : DO Meter With Sensor
Condition As-Received : Used Item
Reference : 2403-0385WSC-5

Cert. No.: 24LM43
Page.: 2 of 2

Procedure Used :-
Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) into Temperature Bath.
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	A52847	2311222	TPA	10 Oct 2024

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function : Temperature measurement

This instrument was connected with temperature sensor S/N 9K2L0010

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
25.0	100	25.002	25.0	-0.002	0.16	2.00
30.0	100	30.003	30.0	-0.003	0.16	2.00
35.0	100	35.004	35.0	-0.004	0.16	2.00

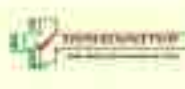
UUC* : Unit Under Calibration

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

-000-

เอกสารไม่ควบคุม

Technology Promotion Association (Thailand-Japan)
Corporate Services 3: Equipment Calibration and Testing Services
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484



Certificate of Calibration

Equipment : DO Meter With Sensor
Manufacturer : Horiba
Model : LAQUA-DO210
Serial No. : HE2L0040
ID No. : UAE.EFM.017/2566(EFM.DO.02/66)
Submitted by : United Analyst and Engineering Consultant Co., Ltd.
3 Soi Udomsuk 41, Sukhumvit Road,
Bangchak Phrakhanong,
Bangkok 10260
Location : TPA Chemistry Calibration Laboratory
Received Order : 12 March 2024
Calibrated Date : 14 March 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V
Calibrated by : Preecha Hlanib
Approved by :
() Pornthippa Tameyakul
() Unnopphol Harachai
(x) Suwit Imjai
Issue Date : 29 March 2024

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
25.0	100	25.002	25.0	-0.002	0.16	2.00
30.0	100	30.003	30.0	-0.003	0.16	2.00
35.0	100	35.004	35.0	-0.004	0.16	2.00

UUC* : Unit Under Calibration

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

By Authority :
Authorized Signatory

By Authority :
Authorized Signatory

เอกสารไม่ควบคุม

Technology Promotion Association (Thailand-Japan)
Corporate Services 3: Equipment Calibration and Testing Services
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484



Certificate of Calibration
Page No. 2 of 2

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
25.0	100	25.002	25.0	-0.002	0.16	2.00
30.0	100	30.003	30.0	-0.003	0.16	2.00
35.0	100	35.004	35.0	-0.004	0.16	2.00

UUC* : Unit Under Calibration

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

$$Q_{\text{meas}} = Q_{\text{ref}} \times \frac{P_{\text{ref}}}{P_{\text{meas}}} \times \frac{T_{\text{ref}}}{T_{\text{meas}}}$$

By Authority :
Authorized Signatory

By Authority :
Authorized Signatory

เอกสารไม่ควบคุม

Calibration Certificate

Equipment:	WYNN-COLL-00000000
Manufacturer:	Allen
Model:	WY-427-Microphone (20-100) Transmitter (20-100)
Serial Num:	00000000000000000000000000000000
Alt Num:	00000000000000000000000000000000

Copyright © 2009 John Wiley & Sons, Ltd.

[illegible]

Location :	—	
Ambient Temperature :	(22.2 ± 0.1)	%
Pressure :	(1.01 ± 0.02)	mm
Relative Humidity :	(20.6 ± 0.1)	%

Incubated Date:	14 SEPTEMBER 2001
Cultivation Time:	12-16 HOURS PER DAY
Size of Area:	12.5 SQUARE METERS

© 2008 Blackwell Publishing Ltd *Journal of Internal Medicine* 263: 105–114

Approved by: *T. Pate*
J. Thomas Pate

The authors do not have a commercial or other association with the manufacturer of the study product, and no financial interest in the study product or its use.

เอกสารไม่ควบคุม

William M. Sullivan 19-00000

Calculation Method

The experiment was conducted by Andrew J. B. C. (1973) in a single-blind, randomised, placebo-controlled trial. The 14 H-H participants in the control and treatment groups were given either a placebo or a 100 mg dose of the active ingredient, respectively. The results of the trial are shown in Table 1. The results show that the active ingredient significantly reduced the number of seizures in the treatment group compared to the control group.

Effectiveness of the model of intervention

4. Following receipt of the 100% payment, the contractor shall provide the following:

[illegible]

2. The cost of a stock is one third lower in level as its market volatility is 10% above the average.

5. The sufficient condition of the previous item is not necessary if

4.2. *Statistical analysis*

© 2004 Blackwell Publishing Ltd, *Journal of Internal Medicine* 255: 103–110

Wiederstein, A. F. 1990. *Phylogenetic relationships of the*

Expenditure	1990	Share of gross value added (community of 1991)
1. Government consumption	3.2	3.6
2. Non-governmental consumption	3.2	3.6
3. Government capital expenditure (excluding depreciation)		
GDP fix	0.3	0.4
GDP fix	0.3	0.6
GDP fix	0.3	0.7
4. Government capital expenditure (excluding depreciation)		
Fix (GDP fix)	0.3	0.6
Fix (GDP fix)	0.3	0.7
Fix (GDP fix)		1.0
5. Government investment expenditure (GDP fix)	0.3	0.6
6. Long-term liability	0.3	0.1
7. Social Security or Social Insurance fund (GDP)	0.3	0.6
8. Social Security (including Social Insurance fund)	0.3	0.6
9. Transfer payments	0.3	0.6
10. Public (GDP fix)	0.3	0.6
11. Government expenditure	0.3	0.6
12. Total (GDP fix)	0.3	0.6

เอกสารไม่ควบคุม

Medical officers

3. Abdominal wall

Indicators (Gravimetric)	Aluminum (%)	Protein (%)	Carbohydrate (%)
Gravimetric	10.0	10.0	10.0

III. Self-Organized Criticality

2.4. Statistical analysis

[illegible]

[†] C: The coagulability of the serum after water was removed by alcohol and ether.

Factor	Weight (kg)
Weight	100
Age	100
Sex	100

¹ B. *discrepant* [dis'grɛnt] 'not in agreement' (Oxford English Dictionary).

Source: <http://www.fishbase.org>; accessed 2009-09-08.

Frequency (1000)	Stressors from outside: frequency weight (1000) (average April 2010)			
	Fire	Climate	W. drought	W. drought
1.25	0.07	0.07	0.07	0.07
2.50	0.15	0.15	0.15	0.15
3.75	1.8	1.8	1.8	1.8

เอกสารไม่ควบคุม

Type: `Ref` = `ref24993`
 Author: `W. J. van den Broek`
 Pages: `4` of `8`

Type: `Int`
 Subtype: `Integer`
 Parent: `Object`

a. *What is the highest level of management in the company?*

Phosphorus: 40.0(4), Sulfur: 32.06(4), Chlorine: 35.45(4), Oxygen: 16.00(4), Nitrogen: 14.01(4), Hydrogen: 1.007(4).

Category (θ)	Shooting Distances (meters) (randomly generated in 0-100)			
	Age	Length	Weight	Perceived Time
0	0.0	0.0	0.0	0.0
100	0.0	0.0	0.0	0.0
200	0.0	0.0	0.0	0.0
300	0.0	0.0	0.0	0.0
400	0.0	0.0	0.0	0.0
500	0.0	0.0	0.0	0.0
600	0.0	0.0	0.0	0.0
700	0.0	0.0	0.0	0.0
800	0.0	0.0	0.0	0.0
900	0.0	0.0	0.0	0.0
1000	0.0	0.0	0.0	0.0

It is completely and duly recognized as a fact:

1.1 Frequency estimation of IIR

Chemical Modifying	Initial pH	Prepared pH	Observed pH	Percentage Change
A. <i>carboxylic</i>	10.4	10.9	10.6	+0.2%
C. <i>carboxylic</i>	10.4	10.9	10.6	+0.2%
Total	10.4	10.9	10.6	+0.2%

^a Litter weight (g) at 1400.

5-mer Whiffers	Whiffers 5-mer	Whiffers 5-mer	Whiffers 5-mer	Whiffers 5-mer
100	100	100	100	100
100	100	100	100	100
100	100	100	100	100
100	100	100	100	100

B. Group-internal stability

Parameter	15.04.2019	15.04.2019	15.04.2019	15.04.2019
Parameter	15.04.2019	15.04.2019	15.04.2019	15.04.2019
Parameter	15.04.2019	15.04.2019	15.04.2019	15.04.2019
Parameter	15.04.2019	15.04.2019	15.04.2019	15.04.2019

เอกสารไม่ควบคุม

¹ *Liquid Mammals: or, the Indispensable Necessity of*

[illegible]

เอกสารไม่ควบคุม

Date Recd. : 01/03/2001
 Date Recd. : 01/03/2001
 Date Recd. : 01/03/2001

Crev. No. - 4132981
 Sub. No. - 14204280
 Stage - 4 of 8

8. Future Research: Evaluating the Well-Being of...

Group	Dependent Variable (1991)	Independent Variable (1991)	Controlled Value (1991)	Assignment Error (1991)
Male	20.2	20.2	20.2	20.2

W. Funder has a copyright

Time Magnitude	Time from maximum T ₂ [min]	Cycle	Maximum Value [mV]	Minimum Value [mV]	Deviation [mV]	Standard Deviation [mV]
Star	0.00	1	0.00	-0.00	0.00	0.00000
	0.00	2	1.17	0.77	0.20	0.00000
	0.00	300	1.00	1.00	0.00	0.00000
Star	0.00	1	0.00	-0.00	0.00	0.00000
	0.00	200	2.25	1.75	0.25	0.00000
	0.00	300	0.00	0.00	0.00	0.00000
Star	0.00	1	0.00	-0.00	0.00	0.00000
	0.00	2	0.00	0.00	0.00	0.00000
	0.00	300	0.00	0.00	0.00	0.00000

2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 2681, 26

Species of fish & catching	Assigned Value =0.0	Observed Value, Logit =0.2	Observed Value =1.0	Assigned Value =1.0
Clupeoidae fish	1.10	1.00	0.5	1.5
Other fish	1.00	1.00	0.5	1.0

Location of site in design	Estimated Value	Observed Value	Observed Value	Comparison
Designing	1.68 ±	1.84 ±	1.68 ±	1.68 ±
Designing	2.02 ±	2.15 ±	2.02 ±	2.02 ±
Designing/Constructing	2.02 ±	2.15 ±	2.02 ±	2.02 ±
Designing/Constructing	2.02 ±	2.15 ±	2.02 ±	2.02 ±

เอกสารไม่ควบคุม

Cover Size: 41.3 cm x 28.1 cm
 Sub Size: 14.6 cm x 10.8 cm
 Pages: 4 of 8

J. L. Kuykendall, University of Illinois

Temperature (°C)		Time (h)	Concentration (g/L)
25	30	1	1.0
25	30	2	1.0
25	30	3	1.0
25	30	4	1.0
25	30	5	1.0
25	30	6	1.0
25	30	7	1.0
25	30	8	1.0
25	30	9	1.0
25	30	10	1.0
25	30	11	1.0
25	30	12	1.0
25	30	13	1.0
25	30	14	1.0
25	30	15	1.0
25	30	16	1.0
25	30	17	1.0
25	30	18	1.0
25	30	19	1.0
25	30	20	1.0
25	30	21	1.0
25	30	22	1.0
25	30	23	1.0
25	30	24	1.0
25	30	25	1.0
25	30	26	1.0
25	30	27	1.0
25	30	28	1.0
25	30	29	1.0
25	30	30	1.0
25	30	31	1.0
25	30	32	1.0
25	30	33	1.0
25	30	34	1.0
25	30	35	1.0
25	30	36	1.0
25	30	37	1.0
25	30	38	1.0
25	30	39	1.0
25	30	40	1.0
25	30	41	1.0
25	30	42	1.0
25	30	43	1.0
25	30	44	1.0
25	30	45	1.0
25	30	46	1.0
25	30	47	1.0
25	30	48	1.0
25	30	49	1.0
25	30	50	1.0
25	30	51	1.0
25	30	52	1.0
25	30	53	1.0
25	30	54	1.0
25	30	55	1.0
25	30	56	1.0
25	30	57	1.0
25	30	58	1.0
25	30	59	1.0
25	30	60	1.0
25	30	61	1.0
25	30	62	1.0
25	30	63	1.0
25	30	64	1.0
25	30	65	1.0
25	30	66	1.0
25	30	67	1.0
25	30	68	1.0
25	30	69	1.0
25	30	70	1.0
25	30	71	1.0
25	30	72	1.0
25	30	73	1.0
25	30	74	1.0
25	30	75	1.0
25	30	76	1.0
25	30	77	1.0
25	30	78	1.0
25	30	79	1.0
25	30	80	1.0
25	30	81	1.0
25	30	82	1.0
25	30	83	1.0
25	30	84	1.0
25	30	85	1.0
25	30	86	1.0
25	30	87	1.0
25	30	88	1.0
25	30	89	1.0
25	30	90	1.0
25	30	91	1.0
25	30	92	1.0
25	30	93	1.0
25	30	94	1.0
25	30	95	1.0
25	30	96	1.0
25	30	97	1.0
25	30	98	1.0
25	30	99	1.0
25	30	100	1.0

John Wiley & Sons, Inc.

Variable	1990-94	1995-99	2000-04	2005-09
Age	25.5	25.5	25.5	25.5
Gender	50.0	50.0	50.0	50.0
Marital status	50.0	50.0	50.0	50.0
Education	50.0	50.0	50.0	50.0
Income	50.0	50.0	50.0	50.0
Health	50.0	50.0	50.0	50.0
Religion	50.0	50.0	50.0	50.0
Occupation	50.0	50.0	50.0	50.0
Region	50.0	50.0	50.0	50.0

Re-regulated companies in 2004 & 2005 are shown in separate boxes. All companies are shown in the order of their first appearance in the sample.

© 2004 Blackwell Publishing Ltd *Journal of Internal Medicine* 255: 103–110

เอกสารไม่ควบคุม

Calibration Certificate

Apparatus : **ANALYST 10000**
Manufacturer : **ANAL**
Model : **ANAL 10000**
Serial No. : **10000000000000000000**
PIN : **10000000000000000000**

Condition At Issue : **GOOD**

Customer : **ANALYST 10000 (ANALYST 10000) (ANALYST 10000)**
Address : **ANALYST 10000 (ANALYST 10000) (ANALYST 10000)**
Contact : **ANALYST 10000 (ANALYST 10000) (ANALYST 10000)**
E-mail : **ANALYST 10000 (ANALYST 10000) (ANALYST 10000)**

Location : **ANALYST 10000 (ANALYST 10000) (ANALYST 10000)**
Applied Temperature : **20.0 ± 0.1 °C**
Pressure : **101.3 ± 0.1 kPa**
Relative Humidity : **50.0 ± 0.1 %**

Received Date : **10/10/2019**
Calibration Due : **10/10/2020**
Date of Issue : **10/10/2019**

Calibrated by : **ANALYST 10000**

Approved by : **T. Pich**
(Head of Calibration)

This certificate is issued in accordance with the requirements of ISO/IEC 17025:2017 and is valid for the period of validity of the certificate.

เอกสารไม่ควบคุม

Calibration Procedure : **1. ANALYST 10000**

Calibration Method

This instrument was calibrated by following the ISO/IEC 17025:2017 standard for measurement item (1.1).
The ISO/IEC 17025:2017 standard is a standard for the management of the laboratory and the laboratory must follow the standard.
The measurement of the instrument was made by the laboratory of the instrument and the laboratory must follow the standard.

Condition of the result of calibration

1. Instrument Condition

Instrument	Model	Serial No.	Serial No.	Serial No.
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000

2. The condition of the instrument was checked by the laboratory of the instrument and the laboratory must follow the standard.

3. The condition of the instrument was checked by the laboratory of the instrument and the laboratory must follow the standard.

- ANALYST 10000 (ANALYST 10000) (ANALYST 10000)
- ANALYST 10000 (ANALYST 10000) (ANALYST 10000)

เอกสารไม่ควบคุม

Summary of Measurement Results

Parameter	Uncertainty (k=1)	Measurement result (uncertainty k=1)
1. Calibration certificate	0.1	0.1
2. Calibration certificate	0.1	0.1
3. Measurement result of the instrument	0.1	0.1
4. Measurement result of the instrument	0.1	0.1
5. Measurement result of the instrument	0.1	0.1
6. Measurement result of the instrument	0.1	0.1
7. Measurement result of the instrument	0.1	0.1
8. Measurement result of the instrument	0.1	0.1
9. Measurement result of the instrument	0.1	0.1
10. Measurement result of the instrument	0.1	0.1
11. Measurement result of the instrument	0.1	0.1
12. Measurement result of the instrument	0.1	0.1
13. Measurement result of the instrument	0.1	0.1
14. Measurement result of the instrument	0.1	0.1
15. Measurement result of the instrument	0.1	0.1
16. Measurement result of the instrument	0.1	0.1
17. Measurement result of the instrument	0.1	0.1

เอกสารไม่ควบคุม

Result of Calibration

1. Instrument condition

Instrument	Model	Serial No.	Serial No.	Serial No.
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000	ANALYST 10000

2. The condition of the instrument was checked by the laboratory of the instrument and the laboratory must follow the standard.

3. The condition of the instrument was checked by the laboratory of the instrument and the laboratory must follow the standard.

Measurement result
0.1
0.1

4. The measurement of the instrument was checked by the laboratory of the instrument and the laboratory must follow the standard.

Parameter	Measurement result
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000

5. Measurement result of the instrument

Parameter	Measurement result
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000
ANALYST 10000	ANALYST 10000

เอกสารไม่ควบคุม

6. Standard Agent used for frequency weighting

Frequency weighting response coefficients W_b (dB)

Frequency (Hz)	Frequency Weighting response coefficients W_b			
	Flat	A-weighted	B-weighted	C-weighted
10	0.0	-20.0	-40.0	-10.0
20	0.0	-26.2	-46.0	-10.0
30	0.0	-31.8	-51.0	-10.0
40	0.0	-36.8	-55.0	-10.0
50	0.0	-41.3	-58.0	-10.0
60	0.0	-45.3	-60.0	-10.0
70	0.0	-48.9	-61.0	-10.0
80	0.0	-52.1	-61.0	-10.0
90	0.0	-54.9	-60.0	-10.0
100	0.0	-57.3	-58.0	-10.0

6. Frequency weighting coefficients W_b (dB)

Frequency weighting coefficients W_b (dB)

Frequency Weighting	Flat	A-weighted	B-weighted	C-weighted
A-weighted	0.0	-3.0	-10.0	-10.0
B-weighted	0.0	-3.0	-10.0	-10.0
C-weighted	0.0	-3.0	-10.0	-10.0

6. Time weighting W_t (dB)

Frequency Weighting	Flat	A-weighted	B-weighted	C-weighted
Flat	0.0	-3.0	-10.0	-10.0
A-weighted	0.0	-3.0	-10.0	-10.0
B-weighted	0.0	-3.0	-10.0	-10.0
C-weighted	0.0	-3.0	-10.0	-10.0

6. Frequency weighting

Frequency Weighting	Flat	A-weighted	B-weighted	C-weighted
A-weighted	0.0	-3.0	-10.0	-10.0

เอกสารไม่ควบคุม

6. Standard Agent used for frequency weighting

Frequency (Hz)	Flat	A-weighted	B-weighted	C-weighted
10	0.0	-20.0	-40.0	-10.0
20	0.0	-26.2	-46.0	-10.0
30	0.0	-31.8	-51.0	-10.0
40	0.0	-36.8	-55.0	-10.0
50	0.0	-41.3	-58.0	-10.0
60	0.0	-45.3	-60.0	-10.0
70	0.0	-48.9	-61.0	-10.0
80	0.0	-52.1	-61.0	-10.0
90	0.0	-54.9	-60.0	-10.0
100	0.0	-57.3	-58.0	-10.0
110	0.0	-59.3	-56.0	-10.0
120	0.0	-60.9	-53.0	-10.0
130	0.0	-62.1	-50.0	-10.0
140	0.0	-63.0	-47.0	-10.0
150	0.0	-63.6	-44.0	-10.0
160	0.0	-64.0	-41.0	-10.0
170	0.0	-64.2	-38.0	-10.0
180	0.0	-64.3	-35.0	-10.0
190	0.0	-64.3	-32.0	-10.0
200	0.0	-64.2	-29.0	-10.0
220	0.0	-63.8	-23.0	-10.0
240	0.0	-63.3	-17.0	-10.0
260	0.0	-62.6	-11.0	-10.0
280	0.0	-61.8	-5.0	-10.0
300	0.0	-60.9	0.0	-10.0
315	0.0	-60.0	0.0	-10.0
330	0.0	-59.0	0.0	-10.0
350	0.0	-57.9	0.0	-10.0
370	0.0	-56.7	0.0	-10.0
390	0.0	-55.4	0.0	-10.0
400	0.0	-55.0	0.0	-10.0
420	0.0	-54.0	0.0	-10.0
440	0.0	-52.9	0.0	-10.0
460	0.0	-51.7	0.0	-10.0
480	0.0	-50.4	0.0	-10.0
500	0.0	-49.0	0.0	-10.0
520	0.0	-47.6	0.0	-10.0
540	0.0	-46.1	0.0	-10.0
560	0.0	-44.6	0.0	-10.0
580	0.0	-43.0	0.0	-10.0
600	0.0	-41.4	0.0	-10.0
630	0.0	-39.7	0.0	-10.0
660	0.0	-38.0	0.0	-10.0
690	0.0	-36.3	0.0	-10.0
710	0.0	-35.0	0.0	-10.0
730	0.0	-33.7	0.0	-10.0
750	0.0	-32.4	0.0	-10.0
770	0.0	-31.1	0.0	-10.0
800	0.0	-29.7	0.0	-10.0
820	0.0	-28.4	0.0	-10.0
840	0.0	-27.1	0.0	-10.0
860	0.0	-25.8	0.0	-10.0
880	0.0	-24.5	0.0	-10.0
900	0.0	-23.2	0.0	-10.0

เอกสารไม่ควบคุม

6. Standard Agent used for frequency weighting

Frequency Weighting	Flat	A-weighted	B-weighted	C-weighted
A-weighted	0.0	-3.0	-10.0	-10.0

6. Time weighting W_t (dB)

Frequency Weighting	Flat	A-weighted	B-weighted	C-weighted
Flat	0.0	-3.0	-10.0	-10.0
A-weighted	0.0	-3.0	-10.0	-10.0
B-weighted	0.0	-3.0	-10.0	-10.0
C-weighted	0.0	-3.0	-10.0	-10.0

6. Frequency weighting

Frequency Weighting	Flat	A-weighted	B-weighted	C-weighted
A-weighted	0.0	-3.0	-10.0	-10.0

Frequency Weighting	Flat	A-weighted	B-weighted	C-weighted
A-weighted	0.0	-3.0	-10.0	-10.0

เอกสารไม่ควบคุม

6. Standard Agent used for frequency weighting

Frequency Weighting	Flat	A-weighted	B-weighted	C-weighted
A-weighted	0.0	-3.0	-10.0	-10.0

6. Time weighting W_t (dB)

Frequency Weighting	Flat	A-weighted	B-weighted	C-weighted
Flat	0.0	-3.0	-10.0	-10.0
A-weighted	0.0	-3.0	-10.0	-10.0
B-weighted	0.0	-3.0	-10.0	-10.0
C-weighted	0.0	-3.0	-10.0	-10.0

No reported correction of sound level measurement uncertainty weighting response W_b (dB)
and time weighting W_t (dB) are not included in the calculation of uncertainty (1.1)

End of Calibration Certificate

เอกสารไม่ควบคุม

List of Instruments Certification for Environmental Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*	Remark
Equipment for Water Quality Analysis									
1	pH Meter	อุณหภูมิ ความเป็นกรด-ด่าง	Mettler-Toledo	Seven Easy S20 / 1231155210	National Food Institute, Ministry of Industry, Thailand	2401718-001-01	11 Mar 24	10 Mar 25	-
2	pH Meter		Mettler-Toledo	Seven Easy S20 / 1230525212	DKSH (Thailand) Ltd.	C07240167	9 Apr 24	8 Apr 25	-
3	Conductivity Meter	ความนำไฟฟ้า (Conductivity)	SI Analytics	Lab955 / 16300356	DKSH (Thailand) Ltd.	C24240057	11 Mar 24	10 Mar 25	-
4	Turbidity Meter	ความขุ่น (Turbidity)	Oakton	T100R / 1120501017	Technology Promotion Association (Thailand-Japan)	24CH1115	6 Sep 24	5 Sep 25	-
5	BOD Incubator	บีโอดี (BOD)	Arco	UC 4-1320 / (UAE: WAO.015/2561)	Technology Promotion Association (Thailand-Japan)	24TM303	10 Feb 24	9 Feb 25	-
6	DO Meter	DO	YSI	5100 / 11B101863	Technology Promotion Association (Thailand-Japan)	24TW39	21 Feb 24	20 Feb 25	-
7	COD Reactor (Heating Block)	ซีโอดี (COD)	Hanna	HI839800 / 1147807	Hanna Instruments (Thailand) Ltd.	HIT-2417-0568	25 Apr 24	24 Apr 25	-
8	Analytical Balance (Readability 0.1 mg)	น้ำหนักเชิงแม่นยำ	Mettler-Toledo	XSR204 / C117635043	Technology Promotion Association (Thailand-Japan)	24MM293	11 May 24	10 May 25	-
9	Analytical Balance (Readability 0.01 mg)	ของแข็งละลายทั้งหมด (TDS) ของแข็งแขวนลอยทั้งหมด (TSS)	Mettler-Toledo	XSR205DU / C210685394	National Food Institute, Ministry of Industry, Thailand	2402283-002-01	2 Apr 24	1 Apr 25	-
10	Hot Air Oven		Memmert	UF55 / B216.1666	National Food Institute, Ministry of Industry, Thailand	2500116-001-01	8 Oct 24	7 Oct 25	-
11	Digester Unit	ทีเคเอ็น (TKN)	FOSS TECATOR	DT2520 / 91794469	National Food Institute, Ministry of Industry, Thailand	2402957-001-01	23 May 24	22 May 25	-
12	Distillation Unit (Kjeldahl Method)		FOSS TECATOR	KT200 / 91790524	FOSS South East Asia	9810	9 Feb 24	7 Feb 25	-

แผนการดำเนินงานโครงการโรงงานบำบัดน้ำดลพิษสุโขทัย (ส่วนขยาย) (ระยะก่อสร้าง และระยะดำเนินการ)
บริษัท น้ำตาลพิษณุโลก จำกัด
ปี 2567

List of Instruments Certification for Environmental Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Mode/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*	Remark
13	UV-VIS Spectrophotometer	ไนโตรเจน-ไนโตรเจน (NO3-N), COD แอมโมเนีย-ไนโตรเจน (NH3-N)	Agilent Technologies	Cary60 G6800A / MY15410009	DOE Services Co.,Ltd.	SP24-018	7 May 24	6 May 25	-
14	Atomic Absorption Spectrophotometer (AAS)	แมกนีсий (Mn), สังกะสี (Zn), ตะกั่ว (Pb), ทองแดง (Cu) แคดเมียม (Cd), ปรอท (Hg), สิลิเนียม (Se), เหล็ก (Fe) แมกนีเซียม (Mg), แคลเซียม (Ca)	Agilent Technologies	System ID:G8432A AA240FS / MY13160001	Thailand Institute of Scientific and Technological Research(TISTR)	MITC.ACL.No 358/67	11 Mar 24	10 Mar 25	-
15	Inductively Coupled Plasma (ICP)		Agilent Technologies	System ID:G8015A G8015AA / MY18030001	Agilent Technologies (Thailand) Co.,Ltd.	Preventive Maintenance Checklist	4 Nov 24	3 Nov 25	-
16	Gas Chromatography (GC)	Trihalomethane	Agilent Technologies	System ID:CN11021007 7890 / CN11021007	Agilent Technologies (Thailand) Co.,Ltd.	Preventive Maintenance Checklist	21 Feb 24	19 Feb 25	-
17	Incubator	แบบที่เรียกกลุ่มโคลิฟอร์มทั้งหมด (Total Coliform Bacteria : TCB) แบบที่เรียกกลุ่มฟิเคอลโคลิฟอร์มทั้งหมด (Fecal Coliform Bacteria : FCB), อีโคไล (E.coli) บันทึกที่ตรวจพบโดยวิธี Standard Plate Count บันทึกที่ตรวจพบโดยวิธี Most Probable Number (MPN) แฟล่งค์ดอมเม็กซ์ แฟล่งค์ดอมสแตร์	Binder	KB400 / 20200000015535	Technology Promotion Association (Thailand-Japan)	24TM647	1 Apr 24	31 Mar 25	-
18	Incubator		Memmert	IPP 260 / V616.0066	Technology Promotion Association (Thailand-Japan)	24TM650	2 Apr 24	1 Apr 25	-
19	Water Bath		Memmert	WNE 14 / L416.0606	Technology Promotion Association (Thailand-Japan)	24TM29	10 Feb 24	8 Feb 25	-
20	Water Bath		Memmert	WNE 14 / L416.0612	Technology Promotion Association (Thailand-Japan)	24TM30	10 Feb 24	8 Feb 25	-
21	Auto Clave		ALP	CL-40L / 807298	National Food Institute, Ministry of Industry, Thailand	2403982-001-01	7 Aug 24	6 Aug 25	-
22	Auto Clave		ALP	CL-40L / 808763	National Food Institute, Ministry of Industry, Thailand	2402281-001-01	2 Apr 24	1 Apr 25	-
23	Analytical Balance		OHAUS	PX623 / C236754745	DKSH (Thailand) Ltd.	2402419-001-01	19 Apr 24	18 Apr 25	-

Calibration Report

Investment	Investment cost: £100,000 Depreciation: £20,000 p.a. (5 years) Revenue: £30,000 p.a. Variable costs: £10,000 p.a. Contribution: £20,000 p.a. Net cash flow: £10,000 p.a.	Yearly cash flow Yearly cash flow Yearly cash flow Yearly cash flow Yearly cash flow
------------	--	---

Downloaded from <http://ajphaphysocpharm.sagepub.com/> at 10:06 04 October 2014

00000000-0000

Downloaded from <http://www.jstor.org/stable/2345678> on Tue, 20 Jun 2016 12:00:00 UTC
All use subject to [JSTOR Terms and Conditions](#)

Cell Number	Sample Temperature (°C)	Conversion (%)	Conversion + 70%
10	100	0	0
20	100	0.1	0
30	100	0.1	0

10

— *Journal of the American Medical Association*

^a The mean number of cases per 100,000 population, by district, is shown in parentheses. The percentage of the population aged 15 years and over is shown in brackets.

© 2000 Blackwell Science Ltd *Journal of Internal Medicine* 247: 395–402

เอกสารไม่ควบคุม

Certificate of Calibration

[illegible]

Author United Analysis and Designing Consultant Company Limited
23rd Uthorn Road, 41 Sukhumvit Road,
Bangkok, Pratumwan, Bangkok 10110 Thailand

Parameter (code)	Temperature	23	25	27	30	35
viscosity	Pa·s	0.010	0.009	0.008	0.007	0.006

Correspondence: E-mail: pranay@pranay.com
2000 Sukhumvit Road, Bangkok
Pranay, Bangkok 10110 Thailand

(continued)	Table 1	Continued
-------------	----------------	-----------

Continuum (1997)

The Westmont coast

© 2007 Blackwell Publishing Ltd
 Journal of Internal Medicine 261: 395–403
 doi: 10.1111/j.1365-2796.2006.01709.x

Chen
 10/10/2019
 10/10/2019

Dr. Bruce A. Wilson
Laboratory Director

There is a significant positive correlation between the number of years of education and the number of years of experience. The correlation coefficient is 0.65, which is significant at the 0.01 level. This suggests that individuals with more education tend to have more experience in their field.

[illegible]

เอกสารไม่ควบคุม

Collective Results

and 18 months.

Type	gcf (mean, best)				Uncertainty of Measurement (%)	Coverage Factor (k)
	1990	1995	2000	2005		
414.02	1419	20.11	2.00	0.00	2.00	
309.80	200	0.24	0.00	0.00	0.00	
286.6	999	3.00	3.00	0.00	0.00	
270.00	107	-0.26	0.00	0.00	0.00	
173.46	774	-0.52	0.00	0.00	0.00	
719.00	779	-0.20	0.00	0.00	0.00	
60.10	30	-0.00	0.00	0.00	0.00	
0	0	-0.00	7.00	0.00	0.00	
407.00	60	0.19	0.00	0.00	0.00	
-176.70	-190	-0.50	0.00	0.00	0.00	
-127.44	-175	0.48	0.00	0.00	0.00	
-200.00	-200	0.04	171.00	0.00	0.00	
-100.0	-100	-0.20	0.00	0.00	0.00	
-500.00	-500	-0.00	70.00	0.00	0.00	
-470.11	-470	0.12	70.00	0.00	0.00	

Practice shape and word parts

The fluorescence collection setup described in the previous section was used to collect the fluorescence spectra of the polymer solutions. The fluorescence spectra were recorded at 25 °C.

Copyright © 2009 John Wiley & Sons, Inc.

The partial value of the determinant: 37.31 (64.9%) - 58.37%.

This new print of the 1974 edition. \$1.00 (pb)

Sample Test Results

Stained Buffer Solution (g/L)	Cell Model Concentration (g/L)	Collection (g/L)	Extraction of Microelement (g/L)	Extraction Period (h)
0.005	0.005	0.010	0.020	0.00
0.005	0.005	0.010	0.020	0.00
0.005	0.005	0.010	0.020	0.00

¹ "Greatest Player" No. 220 (winner) is the greatest left hand talent in contemporary

The first of course



Certificate of Calibration

Equipment: Digital Thermometer with Probe
Model: SmartTemp 401
Serial No.: 122855752
Manufacturer: METTLER TOLEDO
Serial No.: 040-WA0303880

Certificate No.: 010600119
Issue Date: 05 April 2024
Lab No.: WC-0000008
Page: 1 of 2
Calibrator: 14 Calibrator

Customer: United Agency and Engineering Consultant Company Limited
 118/1 Sukhumvit 41 Sukhumvit Road
 Bangkok, Phrayangkong, Bangkok 10250 Thailand

Environmental Condition: Temperature: 23 °C ± 1 °C
 Humidity: 50 %RH ± 10 %RH
 Voltage: 220 VAC ± 10 %

Calibration Place: Metrology Laboratory, DKSH Technology Limited
 2523 Sukhumvit Road, Bangkok
 Phrayangkong, Bangkok 10250 Thailand

Calibrated By: Mr. Pichakorn Kiatphong
Calibration Date: 05 April 2024
The Method used: In-house method, IEC 60751 by comparison with standard thermometer
Traceability: This certificate is traceable to the International System of Units maintained by
 Quality Network Co., Ltd. (QNC) Certificate No. 00020-0775

Mr. Pichakorn Kiatphong
 Version 1.0 (Page 1)

Mr. Pichakorn Kiatphong
 Authorized signatory

This certificate is issued for the purpose of demonstrating the accuracy of the equipment against a reference standard. It is not a statement of the quality of the equipment or the quality of the work performed. The certificate is valid only for the equipment and the conditions specified. The certificate is not valid for any other purpose. The certificate is not valid for any other purpose. The certificate is not valid for any other purpose.

QNC Network Co., Ltd.
 2523 Sukhumvit Road, Bangkok
 Phrayangkong, Bangkok 10250 Thailand
 Phone: 02-000-0000
 Email: info@qnc.co.th

Calibrating Equipment - In-house and External

เอกสารไม่ควบคุม

010600119-01-04-2024

Reference standard equipment

Standard	Certificate no.	Cal. date	Next Cal. date
Digital Thermometer with Probe	QNC-0000008	03 May 23	03 May 24

Calibration Results

Without Adjustment

Series Type: RTD

Channel: 1

Temperature (°C)	Resistance (Ω)	Resistance (Ω)	Resistance (Ω)	Resistance (Ω)
15.5	10.810	10.7	10.800	10.810
20.0	13.800	13.7	13.800	13.810
25.0	16.800	16.7	16.800	16.810

The End of Certificate

QNC Network Co., Ltd.
 2523 Sukhumvit Road, Bangkok
 Phrayangkong, Bangkok 10250 Thailand
 Phone: 02-000-0000
 Email: info@qnc.co.th

Calibrating Equipment - In-house and External

เอกสารไม่ควบคุม

010600119-01-04-2024



Certificate of Calibration

Equipment: CONDUCTIVITY METER
Model: 4000 RSC
Serial No. (or ID): 4000000
Manufacturer: HI-ANALYTICAL
Electronic Serial No.: 4000000

Certificate No.: 010600119
Issue Date: 01 May 2024
Lab No.: WC-0000008
Page: 1 of 2
Calibrator: 14 Calibrator

Customer: United Agency and Engineering Consultant Company Limited
 118/1 Sukhumvit 41 Sukhumvit Road
 Bangkok, Phrayangkong, Bangkok 10250 Thailand

Environmental Condition: Temperature: 23 °C ± 1 °C
 Humidity: 50 %RH ± 10 %RH

Calibration Place: Metrology Laboratory, DKSH Technology Limited
 2523 Sukhumvit Road, Bangkok
 Phrayangkong, Bangkok 10250 Thailand

Calibrated By: Mr. Pichakorn Kiatphong
Calibration Date: 01 May 2024
The Method used: In-house method, IEC 60751 by comparison with standard thermometer
Traceability: This certificate is traceable to the International System of Units maintained by
 Quality Network Co., Ltd. (QNC) Certificate No. 00020-0775

Mr. Pichakorn Kiatphong
 Version 1.0 (Page 1)

Mr. Pichakorn Kiatphong
 Authorized signatory

This certificate is issued for the purpose of demonstrating the accuracy of the equipment against a reference standard. It is not a statement of the quality of the equipment or the quality of the work performed. The certificate is valid only for the equipment and the conditions specified. The certificate is not valid for any other purpose. The certificate is not valid for any other purpose. The certificate is not valid for any other purpose.

QNC Network Co., Ltd.
 2523 Sukhumvit Road, Bangkok
 Phrayangkong, Bangkok 10250 Thailand
 Phone: 02-000-0000
 Email: info@qnc.co.th

Calibrating Equipment - In-house and External

เอกสารไม่ควบคุม

010600119-01-05-2024

Calibration Results

With Adjustment

Standard	1014 In-house Calibration	Calibration	Coverage Factor	Uncertainty (k=1)
Conductivity Solution	Reading	Reading	1.0	(k=1)
10.000 g/L	10.000 g/L	10.000 g/L	1.0	0.000 g/L
10.000 g/L	10.000 g/L	10.000 g/L	1.0	0.000 g/L
10.000 g/L	10.000 g/L	10.000 g/L	1.0	0.000 g/L

After Adjustment: at 10.000 g/L

Standard	1014 In-house Calibration	Calibration	Coverage Factor	Uncertainty (k=1)
Conductivity Solution	Reading	Reading	1.0	(k=1)
10.000 g/L	10.000 g/L	10.000 g/L	1.0	0.000 g/L
10.000 g/L	10.000 g/L	10.000 g/L	1.0	0.000 g/L
10.000 g/L	10.000 g/L	10.000 g/L	1.0	0.000 g/L

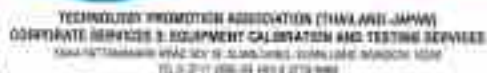
The End of Certificate

QNC Network Co., Ltd.
 2523 Sukhumvit Road, Bangkok
 Phrayangkong, Bangkok 10250 Thailand
 Phone: 02-000-0000
 Email: info@qnc.co.th

Calibrating Equipment - In-house and External

เอกสารไม่ควบคุม

010600119-01-05-2024



East, W. L. 2004. 198.

Experiment No.:	Faculty Name:
Manufacturer:	Date:
Model:	Topic:
Serial No.:	Y202001011
Ed. No.:	14022007000000
Location: No. Room:	Unit No.:
Received Date:	05 September 2020
Calibrator Name:	06 September 2020
Reference:	060301172902
Submitted By:	United Arab Emirates Engineering Council (UAE-EEEC) P.O. Box 14160, Al Khail Road, Phase B, Sharjah, United Arab Emirates, 34202
Adjustment Temperature:	(20 ± 0.5) °C
Relative Humidity:	(50 ± 25) %
Calibrator Branding:	1) Issue: 000001 06-09-20 (Not recommended by any Factory setting solution)
Calibrated By:	Youssef Alshams
Approved By:	 Approved Signature
☐ International Organization ☐ Pressure: Pa/Psi ☐ Density: kg/m³	
Serial Date:	6 September 2020

The β -coefficients are for a confidence probability of approximately 85%.

เอกสารไม่ควบคุม



Continued on page 228

- | Worksheet: Standard Instruments | | | | |
|---|------------|-----------|-----------------|--------------|
| Instrument | Serial No. | U. No. | Certificate No. | Due date |
| 1) Thermogravimetric | 1-1234567 | 1-1234567 | 1-1234567 | 12 July 2018 |
| 2) Electronic Balance | 2-7654321 | 2-7654321 | 2-7654321 | 20 Feb 2019 |
| <p>3) The Certificate is valid only if it brought for every instrument inspection (Printer: name)</p> | | | | |
| <p>4) Standard Material: The following materials are used in the standard material:</p> | | | | |
| Material | Material | U. No. | Serial | Due |
| 1) Hydrochloric acid | 1-1234567 | 1-1234567 | 1-1234567 | 12 July 2018 |
| 2) Hydrochloric acid | 2-7654321 | 2-7654321 | 2-7654321 | 20 Feb 2019 |
| <p>5) The certificate is valid only if it brought for every instrument inspection (Printer: name)</p> | | | | |

Edinburgh, 1704-5

Pumping Site - Permit suspension; standard curve by using 0.25, 0.5 and 1.00 g/l
 Family Meter - Series Number: 112809617

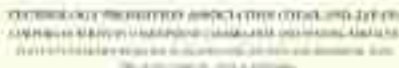
Standard Formulas: α -suppression (α NTU)	AMEC®-Ranking (α NTU)	Universally or Manufacturers (α NTU)	Country Factor α
1	0.00	0.0000	0.00
20	00.2	0.00	0.00
100	00	0.00	0.00
500	001	0.0	0.00
1000	0011	0.0	0.01

Summary: - AGU = Greek Under Conference
- NTU = Netherland University, Technische Universiteit

The reported frequency of these current and future risk factors was strongly related to a range of factors, including a host of confounders, as summarised in Table 2.

1998

เอกสารไม่ควบคุม



Case No. 237902
Page: 6 of 8

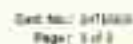
Equipment:	8002 incubator
Media/Reagent:	HBG
Model:	LC-4000
Batch No.:	0200040800000
W. No.:	002/0402040000
Submitted by:	Cellul Analysis and Engineering Graduate School 4-1-10 Chiyoda-1st, Chiyoda Ward, Tokyo, Japan Institute, 0000
Location:	Lab Floor 1
Received Date:	01 February 2000
Collection Date:	01 February 2000
Analysis Temperature:	(20 ± 1) °C
Relative Humidity:	(70 ± 5) %
Collected by:	XXXXXXXXXXXX
Approval by:	 Approval Authority

☐ Portland Cement
☒ Ungrouted Mortar
☐ Seal coat

14668 • J. Neurosci., February 22, 2006 • 26(8):14662–14668

The likelihood of a confidence interval of approximately 95%.

เอกสารไม่ควบคุม



Equipment:	ECO module
Condition As Received:	Good item
Release:	MS-03000-1
Reason for Submission:	(*) With a Release
Location of MSF:	Temperature Sensor
Flight or Supply:	Not known

Substrate	Yield ^a	Yield ^b	Temperature stability	Temperature stability	Onset of	Onset of
Rate	decolor.	decolor.	(°C)	(°C)	discolor.	discolor.
1	75	70	100	100	170	8
2	80	78	230	230	18	3

Temperature Point	Mercurial Temperature (°C)								Accuracy
	Position								
	0	2	4	6	8	7	9	(mm)	
000	13.0(75)	13.0(50)	12.5(50)	13.0(50)	13.0(50)	13.0(50)	13.0(50)	13.0(50)	0.00

Average^a: the average of 20 values in each condition.

Temperature stability: The effect of the greatest mean difference of measured temperatures is very low across

Temperature uniformity: The maximum difference of measured temperatures at study sensors and the measured temperature of the reference location, which are checked at the same time at all sites at observation time, is possible if necessary, the temperature pattern is homogeneously after the standard under study, even without

1997: 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

Note: The reported accuracy of respondents was 100% and 99% for the two studies.

The expected frequency of misplacement was based on a standard normally distributed in a coverage factor k , providing a level of confidence of approximately 95 %.

1000

เอกสารไม่ควบคุม



Equipment: NOO Inverter
 Condition Referred: Load
 Reference: JAS-020001.4
 Procedure Used: -

Cert. No.: JPT0001
 Page: 3 of 3

Condition was confirmed using calibration procedure JPT0001 based on JIS B 1201 according to power measurement method with IEC Application note connected with Harmonic Transformer Detector (HTD).
 The temperature value used was based on JIS B 1201.

Condition of this result of calibration

1. Reference standard instrument

Equipment: Serial No.: 0700000011
 Cert. No.: 20190001
 Transfer: TMA
 Due Date: 27 Dec 2024

2. This certificate is valid only for the item calibrated on this acceptance of calibration.
 3. This certificate is transferable to the International System of Units.

Remark: TMA: Technology Promotion Association (Thailand-Japan)

Result of Calibration: (1) Without Adjustment

Position of M207: Temperature: Room

Frequency setting: 50 Hz



Environment during calibration		
	Beginning	Finished
Temp. (°C)	20	20
Humidity (%)	50	50
AC Supply (VAC)	200	200

Position	Ref. Std. ID No.
1	JEKTS-01
2	JEKTS-02
3	JEKTS-03
4	JEKTS-04
5	JEKTS-05
6	JEKTS-06
7	JEKTS-07
8	JEKTS-08
9 (Avg.)	JEKTS-09

Power frequency tests

4.5	50	Hz
5.0	50	Hz
5.5	50	Hz

Dimension of Chamber

200	100	mm
300	100	mm
400	100	mm

Capacity: 0.08 m³

เอกสารไม่ควบคุม



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
 CORPORATE AMBASSADOR - INCORPORATE CALIBRATION AND TESTING ADDRESS
 HANNA INSTRUMENTS (THAILAND) CO., LTD. (HANNAINSTRUMENTS.CO.TH)
 111, Vithayakarn Road, Bangkok 10110

Cert. No.: JPT0001
 Page: 1 of 2

Certificate of Testing

Equipment: 3rd Meter
 Manufacturer: VLS
 Model: 3000
 Serial No.: 100-101000
 ID No.: LAD-000110000000
 Received Date: 20 February 2024
 Test Date: 21 February 2024
 Reference: JAS-020001.4
 Submitted to: United Analytic and Engineering Company Co., Ltd.
 3-1st Floor, 41/ Ratchadapisek Road, Bangkok
 Phrasarang, Bangkok 10200
 Laboratory Condition: Temperature: (20 ± 0.5) °C
 Humidity: (50 ± 20) %
 Test Procedure: as per JAS-020001.4
 Issued by: Vithayakarn
 Approved by: [Signature]
 Approved Signature
 1. Phrasarang, Bangkok
 2. Phrasarang, Bangkok
 3. Phrasarang, Bangkok
 Issue Date: 21 February 2024

เอกสารไม่ควบคุม



Cert. No.: JPT0001
 Page: 3 of 3

Condition of this result of calibration

1. Reference standard instrument

This certificate is transferable to the International System of Units through the reference standard instrument of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan)

Instrument: Serial No.: 1000000011
 Cert. No.: 20190001
 Due Date: 27 Dec 2024

2. Standard Material

Material: Standard Material
 Material: 1000000011
 Serial: 1000000011
 Due Date: 27 Dec 2024

Remark: Standard Oxygen Meter Adjustment W00-A0000
 Standard Oxygen Probe No.: 0000000011

Standard Material (Units Modification Method)	Unit Meter Reading	Standard Conversion
(kg)	(kg)	(kg)
0.001	0.001	0.0000

This report was certified only for the instrument we tested (it is allowable to use for study about issues for advertising and other purposes is prohibited) This report may not be reproduced other than without written approval of the laboratory.

0000

เอกสารไม่ควบคุม



HANNA Instruments (Thailand) Co., Ltd.
 111, Vithayakarn Road, Bangkok 10110
 HANNA Instruments (Thailand) Co., Ltd.



Cert. No.: JPT0001
 Page: 1 of 2

CERTIFICATE OF CALIBRATION

Equipment: 1000000011
 Manufacturer: HANNA
 Model: 1000000011
 Serial No.: 1000000011
 ID No.: 1000000011
 Received Date: 20 February 2024
 Test Date: 21 February 2024
 Reference: JAS-020001.4
 Submitted to: United Analytic and Engineering Company Co., Ltd.
 3-1st Floor, 41/ Ratchadapisek Road, Bangkok
 Phrasarang, Bangkok 10200
 Laboratory Condition: Temperature: (20 ± 0.5) °C
 Humidity: (50 ± 20) %
 Test Procedure: as per JAS-020001.4
 Issued by: Vithayakarn
 Approved by: [Signature]
 Approved Signature
 1. Phrasarang, Bangkok
 2. Phrasarang, Bangkok
 3. Phrasarang, Bangkok
 Issue Date: 21 February 2024

1. Phrasarang, Bangkok
 2. Phrasarang, Bangkok
 3. Phrasarang, Bangkok
 Issue Date: 21 February 2024



This certificate was certified only for the instrument we calibrated.
 The result of calibration was based on the standard and the value of calibration only.
 This certificate may not be reproduced other than in full, except with the prior written approval of the head of HANNA Instruments (Thailand).

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม



Request No. 20-46 / 2023

2 / 3

MTC, ACL No. 387 / 66

2. Precision

Element	Conc.	Repeatability						Rel.	CV	RelSD
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Cu	0.02	0.0002	0.0004	0.0004	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0005	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005
	0.50	0.0004	0.0005	0.0004	0.0005	0.0004	0.0004	0.0005	0.0005	0.0005
Zn	0.02	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Pb	0.02	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Cd	0.02	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Mn	0.02	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Fe	0.02	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Ni	0.02	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Co	0.02	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0004	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005

Continue 3/3

ANALYTICAL METROLOGY AND TESTING SERVICE CENTRE

This report was generated by the system and is not a legal document.

Request No. 20-46 / 2023
Requester: Mr. [Name]
Requester Address: [Address]
Requester Phone: [Phone]
Requester Email: [Email]
Requester Signature: [Signature]

Request No. 20-46 / 2023
Requester: Mr. [Name]
Requester Address: [Address]
Requester Phone: [Phone]
Requester Email: [Email]
Requester Signature: [Signature]

เอกสารไม่ควบคุม



Request No. 20-46 / 2023

2 / 3

MTC, ACL No. 387 / 66

3.4 Repeatability on wavelength: Iron (Fe) at 248.3 nm

Element	Standard Value of Fe	Repeatability	Error of Measurement	Error of Measurement	Repeatability
	mg/L	mg/L	mg/L	mg/L	mg/L
Fe	0.02	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0005	0.0005

3.5 Repeatability on wavelength: Lead (Pb) at 210.2 nm

Element	Standard Value of Pb	Repeatability	Error of Measurement	Error of Measurement	Repeatability
	mg/L	mg/L	mg/L	mg/L	mg/L
Pb	0.02	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0005	0.0005

3.6 Repeatability on wavelength: Manganese (Mn) at 279.5 nm

Element	Standard Value of Mn	Repeatability	Error of Measurement	Error of Measurement	Repeatability
	mg/L	mg/L	mg/L	mg/L	mg/L
Mn	0.02	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0005	0.0005

Continue 3/3

ANALYTICAL METROLOGY AND TESTING SERVICE CENTRE

This report was generated by the system and is not a legal document.

Request No. 20-46 / 2023
Requester: Mr. [Name]
Requester Address: [Address]
Requester Phone: [Phone]
Requester Email: [Email]
Requester Signature: [Signature]

Request No. 20-46 / 2023
Requester: Mr. [Name]
Requester Address: [Address]
Requester Phone: [Phone]
Requester Email: [Email]
Requester Signature: [Signature]

เอกสารไม่ควบคุม



Request No. 20-46 / 2023

3 / 3

MTC, ACL No. 387 / 66

3. Precision

3.1 Repeatability on wavelength: Chromium (Cr) at 283.8 nm

Element	Standard Value of Cr	Repeatability	Error of Measurement	Error of Measurement	Repeatability
	mg/L	mg/L	mg/L	mg/L	mg/L
Cr	0.02	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0005	0.0005

3.2 Repeatability on wavelength: Chromium (Cr) at 283.8 nm

Element	Standard Value of Cr	Repeatability	Error of Measurement	Error of Measurement	Repeatability
	mg/L	mg/L	mg/L	mg/L	mg/L
Cr	0.02	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0005	0.0005

3.3 Repeatability on wavelength: Copper (Cu) at 283.8 nm

Element	Standard Value of Cu	Repeatability	Error of Measurement	Error of Measurement	Repeatability
	mg/L	mg/L	mg/L	mg/L	mg/L
Cu	0.02	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0005	0.0005

Continue 4/3

ANALYTICAL METROLOGY AND TESTING SERVICE CENTRE

This report was generated by the system and is not a legal document.

Request No. 20-46 / 2023
Requester: Mr. [Name]
Requester Address: [Address]
Requester Phone: [Phone]
Requester Email: [Email]
Requester Signature: [Signature]

Request No. 20-46 / 2023
Requester: Mr. [Name]
Requester Address: [Address]
Requester Phone: [Phone]
Requester Email: [Email]
Requester Signature: [Signature]

เอกสารไม่ควบคุม



Request No. 20-46 / 2023

3 / 3

MTC, ACL No. 387 / 66

3.7 Repeatability on wavelength: Nickel (Ni) at 232.0 nm

Element	Standard Value of Ni	Repeatability	Error of Measurement	Error of Measurement	Repeatability
	mg/L	mg/L	mg/L	mg/L	mg/L
Ni	0.02	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0005	0.0005

3.8 Repeatability on wavelength: Zinc (Zn) at 213.9 nm

Element	Standard Value of Zn	Repeatability	Error of Measurement	Error of Measurement	Repeatability
	mg/L	mg/L	mg/L	mg/L	mg/L
Zn	0.02	0.0005	0.0005	0.0005	0.0005
	0.10	0.0005	0.0005	0.0005	0.0005
	0.50	0.0005	0.0005	0.0005	0.0005

Remark: The reported repeatability is an expected repeatability based on the standard deviation (SD) of the repeatability test.

Calculated by: [Signature]

Mr. [Name]

Mr. [Name]

Approved by: [Signature]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

Mr. [Name]

ANALYTICAL METROLOGY AND TESTING SERVICE CENTRE

End of Certificate

This report was generated by the system and is not a legal document.

Request No. 20-46 / 2023
Requester: Mr. [Name]
Requester Address: [Address]
Requester Phone: [Phone]
Requester Email: [Email]
Requester Signature: [Signature]

Request No. 20-46 / 2023
Requester: Mr. [Name]
Requester Address: [Address]
Requester Phone: [Phone]
Requester Email: [Email]
Requester Signature: [Signature]

เอกสารไม่ควบคุม

Agilent CrossLab Start Up Services

Agilent 5100 5110 ICP-OES Preventive Maintenance

Agilent provides a standard service providing recommended service for your instrument to ensure stable operation and the economy of your results.

Delivered by highly trained and certified service engineers using genuine Agilent parts and supplies, Agilent Preventive Maintenance provides what you need to ensure optimum operation and long-term service life of your instrument.

This checklist is used as a guide for completing the preventive maintenance tasks. An Agilent Service Engineer is provided for your results.

Document ID: G4310-90001-01 (Agilent 5100)
Document Number: 59914-90001-01
Agilent Technologies Inc. (US)

Agilent 5100



เอกสารไม่ควบคุม

Introduction

Customer Information

- Instrument manufacturers recommend regularly scheduled maintenance of the system.
- A customer representative should be available to the engineer while performing the preventive maintenance procedure. Customer information for the specific maintenance and its associated features of the service agreement.
- Any parts not included in the items on this list of the items are not part of the maintenance. These items should be replaced or repaired at the cost of the device.
- If a system requires the use of external agent maintenance, such as the maintenance service, then there must be a valid agreement with the agent, which may be a subcontractor.
- The customer using ICP applications, the instrument should be checked for the ICP application introduction system.

Document ID: G4310-90001-01 (Agilent 5100)
Document Number: 59914-90001-01
Agilent Technologies Inc. (US)

Agilent 5100



เอกสารไม่ควบคุม

Agilent 5100 5110 ICP-OES Preventive Maintenance Checklist



Important Customer Web Links

- To access **Agilent University**, visit <http://www.agilent.com/chem/university> to learn about training options, which include online, classroom and on-site delivery. Contact your local Agilent sales office for more information or for a quote.
- To access the **Agilent Resource Center**, visit <http://www.agilent.com/chem/resourcecenter>. The following information is available:
 - Sample and instrument
 - General information
 - Analysis
 - Service and support
 - Application information
- The **Agilent Gateway** is a website that helps you learn, understand and improve your application and Agilent products, and that helps you learn and understand the Agilent service and support. Visit <http://www.agilent.com/gateway>.
- Visit the **Agilent** website, <http://www.agilent.com>, for more information on the Agilent service and support.
- Visit the **Agilent** website, <http://www.agilent.com>, for more information on the Agilent service and support.

Document ID: G4310-90001-01 (Agilent 5100)
Document Number: 59914-90001-01
Agilent Technologies Inc. (US)

Agilent 5100



เอกสารไม่ควบคุม

Agilent 5100 5110 ICP-OES Preventive Maintenance Checklist



Service Engineer's Responsibilities

- Follow the customer information that all service engineers should follow the preventive maintenance with.
- To provide the customer with a list of the system or system being replaced.
- Complete any tasks and the related information.
- Complete the related information of the system using either a "Service Engineer" or "Service Engineer" checklist.
- Check "Service and support" checklist and ensure that the information is followed, as described.
- Complete the preventive maintenance checklist in the main Agilent service and support website.
- Complete the **Service and support** checklist with the customer.
- Complete the tasks for your customer's system (if you are not a service engineer).
- Add the customer's name to the service and support website to ensure that the information is followed.
- Add the customer's name to the **Service and support** website to ensure that the information is followed.

Document ID: G4310-90001-01 (Agilent 5100)
Document Number: 59914-90001-01
Agilent Technologies Inc. (US)

Agilent 5100



เอกสารไม่ควบคุม

Instrument Maintenance

System Information

- Check Agilent E-Series instrument configuration against the default values of the configuration table.

Instrument System Model no (SI)	SI no +04 349-063
Instrument System file and location	UNC

Left System Component/Module Number	Right System Component/Module Number
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	26
27	28
29	30
31	32
33	34
35	36
37	38
39	40
41	42
43	44
45	46
47	48
49	50
51	52
53	54
55	56
57	58
59	60
61	62
63	64
65	66
67	68
69	70
71	72
73	74
75	76
77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100

ICP-OES Configuration Table	Verify the box is ticked in the report of the
Module Type	Single Beam (SI) or Dual Beam (SI)
Optical Element	Quartz (SI) or Sapphire (SI) or Sapphire (SI) or Sapphire (SI)
Tube	Ar (SI) or Ar (SI) or Ar (SI) or Ar (SI)
Tube Type	Standard (SI) or Standard (SI) or Standard (SI) or Standard (SI)
Tube Material	Quartz (SI) or Sapphire (SI) or Sapphire (SI) or Sapphire (SI)
Tube Length	1.0 m (SI) or 1.5 m (SI) or 2.0 m (SI) or 2.5 m (SI)
Tube Diameter	1.0 m (SI) or 1.5 m (SI) or 2.0 m (SI) or 2.5 m (SI)
Tube Material	Quartz (SI) or Sapphire (SI) or Sapphire (SI) or Sapphire (SI)

เอกสารไม่ควบคุม

Preparation

- Check the instrument status with the customer before starting.
- Review the instrument logbook for recorded problems and comments.
- Take instrument status before starting the procedure.
- Verify the instrument is powered on and the system is ready to run.
- Check the proper installation of parts, gas flow, and pressure.
- Check the instrument for required installation of components and proper installation of the instrument.
- Check for required firmware updates and verify with customers if they need to be performed.
- Verify application software, if needed, is installed and the instrument is ready to run.
- Check the instrument for any other issues that may affect the instrument's performance.

เอกสารไม่ควบคุม

Preventive Maintenance Procedures

Record Pre-PM instrument performance

- Subtract instrument performance test.
- Record results in instrument performance test results table in the PM.

Clean and inspect ICP-OES system

- Check for any obvious problems during the procedure.
- Inspect and clean the instrument and gas flow components and the gas flow components.
- Inspect the instrument for any problems and the instrument for any problems.
- Inspect the instrument for any problems and the instrument for any problems.
- Inspect the instrument for any problems and the instrument for any problems.
- Inspect the instrument for any problems and the instrument for any problems.
- Inspect the instrument for any problems and the instrument for any problems.
- Inspect the instrument for any problems and the instrument for any problems.
- Inspect the instrument for any problems and the instrument for any problems.
- Inspect the instrument for any problems and the instrument for any problems.

Agilent Water Recirculation

- Service not applicable.
- Check the water recirculation system and the water recirculation system.
- Check the water recirculation system and the water recirculation system.
- Check the water recirculation system and the water recirculation system.
- Check the water recirculation system and the water recirculation system.

เอกสารไม่ควบคุม

SPS 3 Auto Sampler

Service not applicable

- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.

SPS 4 Auto Sampler

Service not applicable

- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.

AUX 4, 5, 7 Automated Valve System

Service not applicable

- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.
- Check the instrument status with the customer before starting.

เอกสารไม่ควบคุม

ICP-OES adjustment

- ☒ Check position of 21 ppm adjust if required
- ☒ Check Argon flow, adjust to specified value if required
- ☒ Perform element calibration
- ☒ Perform nebulizer calibration

Recent Post-PM Instrument performance

- ☒ Run instrument Performance test
- ☒ Save results in Instrument Performance Test Results Table - Post PM
- ☒ For systems using ICP-Capex system, also save, per the following table and notes

- ☒ Scavenger Communication Test
- ☒ Air Flow
- ☒ Argon Flow
- ☒ Gas Flow
- ☒ RF Generator
- ☒ Sample Tray
- ☒ System Test
- ☒ Validation Test

- ☒ Record Performance Test Instrument Test Results Table

เอกสารไม่ควบคุม

Restore Instrument

- ☐ Turn off equipment, and the customer to install their sample introduction system. **W4**
- ☒ Lock keys in a safe when not using key.
- ☒ Conduct PMs for post-restore performed prior to sample introduction, because the customer provided as a guide for the instrument set up and checkout.

Service Review

- ☒ Review available service history of address for the instrument.
- ☒ Review the Instrument Maintenance periodicity in the customer's monthly logbook.
- ☒ Review the test used in the Instrument logbook, if applicable.
- ☒ Update the instrument maintenance record as appropriate.
- ☒ Offer the first order call or support on-site as appropriate, based on the customer request.
- ☒ Complete the Service Support Summary report, follow up additional warranty.
- ☒ Review the service performance and the results shared with the Customer.
- ☒ If a maintenance schedule was violated, notify the facility to fix the change in the Service Support Summary table. System is supporting service to have additional additional maintenance.
- ☒ Complete the System Page with both Service Engineer and Customer signature.

เอกสารไม่ควบคุม

Test Results

Instrument Performance Test Results Table

Note: These measurements do not form part of any specification and are for reference only.

	Pre-PM Testability Check		Post-PM Testability Check	
	Result	Unit	Result	Unit
Scavenger Communication Test	Pass	✓	Pass	✓
Air Flow	15.5 L/min	L/min	15.5 L/min	L/min
Argon Flow	15.5 L/min	L/min	15.5 L/min	L/min
Gas Flow	15.5 L/min	L/min	15.5 L/min	L/min
RF Generator	Pass	✓	Pass	✓
Sample Tray	Pass	✓	Pass	✓
System Test	Pass	✓	Pass	✓
Validation Test	Pass	✓	Pass	✓

Pass result is passing for the test, Fail result is failing the test.

Performance Test Results Table

Note: The Instrument Test results for systems using ICP-Capex system, also save per the following table.

Instrument Test	Result
Scavenger Communication Test	Pass
Air Flow	15.5 L/min
Argon Flow	15.5 L/min
Gas Flow	15.5 L/min
RF Generator	Pass
Sample Tray	Pass
System Test	Pass
Validation Test	Pass

เอกสารไม่ควบคุม

ICP-OES Status Summary Table

Note: These measurements do not form part of any specification and are for reference only.

Measurement	Testable	Pass/Fail	Result	Unit
Scavenger Communication Test	Pass	✓	Pass	✓
Air Flow	15.5 L/min	✓	15.5 L/min	L/min
Argon Flow	15.5 L/min	✓	15.5 L/min	L/min
Gas Flow	15.5 L/min	✓	15.5 L/min	L/min
RF Generator	Pass	✓	Pass	✓
Sample Tray	Pass	✓	Pass	✓
System Test	Pass	✓	Pass	✓
Validation Test	Pass	✓	Pass	✓
Scavenger Communication Test	Pass	✓	Pass	✓
Air Flow	15.5 L/min	✓	15.5 L/min	L/min
Argon Flow	15.5 L/min	✓	15.5 L/min	L/min
Gas Flow	15.5 L/min	✓	15.5 L/min	L/min
RF Generator	Pass	✓	Pass	✓
Sample Tray	Pass	✓	Pass	✓
System Test	Pass	✓	Pass	✓
Validation Test	Pass	✓	Pass	✓

Pass result is passing

เอกสารไม่ควบคุม

[illegible]

เอกสารไม่ควบคุม

Forward Test		Pass
Result		
Forward Measurement	Specification	Measured Value % TOL
6x100 800 rev	± 0.01	0.01
6x100 820 rev	± 0.01	0.01
2x1115 800 rev	± 0.01	0.01
4x1225 820 rev	± 0.01	0.01
4x1250 810 rev	± 0.01	0.01
4x1250 182 rev	± 0.01	0.01
6x1400 400 rev	± 0.01	0.01
6x1500 440 rev	± 0.01	0.01

Test		
Forward Measurement	Specification	Measured Value % TOL
6x100 800 rev	± 0.01	0.01
6x100 820 rev	± 0.01	0.01
2x1200 820 rev	± 0.01	0.01
2x1310 810 rev	± 0.01	0.01
2x1314 820 rev	± 0.01	0.01
4x1325 800 rev	± 0.01	0.01
6x1350 810 rev	± 0.01	0.01
1x1500 110 rev	± 0.01	0.01
1x1504 120 rev	± 0.01	0.01
4x1500 102 rev	± 0.01	0.01
6x1500 140 rev	± 0.01	0.01
6x1500 180 rev	± 0.01	0.01

เอกสารไม่ควบคุม

Report Summary	
Instrument Model	Agilent 61000112 2010-ICP-MS
Instrument ID	000110000100
Instrument Serial Number	0010000001
Software Version	7.2.1.0000
Firmware Version	5402
Tested By	Kayaldeen E.
Test Completed On	11/13/2015 11:05:02 AM
Result Summary	
Gas/Arson Contamination Test	Pass
GC Flow Test	Skipped
Mass Flow Test	Skipped
Gas Flow Test	Skipped
IC Generator Test	Skipped
Detector Test	Skipped
Optics Test	Pass
External Value Content Test	Skipped
Intakeable Test	Pass
Recovery Test	Pass
Precision Test	Pass
Background Communication Test	Pass
Options Test	
	Pass
Intensity	100000
Wavelength	707.812
	4030.0
	707.812

เอกสารไม่ควบคุม

Excitation Type	Excitation	Wavelength
H (10-211 nm)	0.40	0.00
He (100-000 nm)	0.40	0.00
Li (100-000 nm)	0.40	0.00
Ne (100-000 nm)	0.40	0.00
Ar (100-000 nm)	0.40	0.00
Kr (100-000 nm)	0.40	0.00
Xe (100-000 nm)	0.40	0.00
He (100-000 nm)	0.40	0.00
Ne (100-000 nm)	0.40	0.00
Ar (100-000 nm)	0.40	0.00
Kr (100-000 nm)	0.40	0.00
Xe (100-000 nm)	0.40	0.00
He (100-000 nm)	0.40	0.00
Ne (100-000 nm)	0.40	0.00
Ar (100-000 nm)	0.40	0.00
Kr (100-000 nm)	0.40	0.00
Xe (100-000 nm)	0.40	0.00
He (100-000 nm)	0.40	0.00
Ne (100-000 nm)	0.40	0.00
Ar (100-000 nm)	0.40	0.00
Kr (100-000 nm)	0.40	0.00
Xe (100-000 nm)	0.40	0.00

เอกสารไม่ควบคุม

Swedish Test		Page	
Page			
Current (Wavelength)	Specification	Method	Ratio
As (190-200 nm)	0.400	0.000	100.0
As (190-200 nm)	0.400	0.000	100.0
As (210-200 nm)	0.400	0.000	100.0
As (220-200 nm)	0.400	0.000	100.0
As (230-200 nm)	0.400	0.000	100.0
As (240-200 nm)	0.400	0.000	100.0
As (250-200 nm)	0.400	0.000	100.0
As (260-200 nm)	0.400	0.000	100.0
As (270-200 nm)	0.400	0.000	100.0
As (280-200 nm)	0.400	0.000	100.0
As (290-200 nm)	0.400	0.000	100.0
As (300-200 nm)	0.400	0.000	100.0
As (310-200 nm)	0.400	0.000	100.0
As (320-200 nm)	0.400	0.000	100.0
As (330-200 nm)	0.400	0.000	100.0
As (340-200 nm)	0.400	0.000	100.0
As (350-200 nm)	0.400	0.000	100.0
As (360-200 nm)	0.400	0.000	100.0
As (370-200 nm)	0.400	0.000	100.0
As (380-200 nm)	0.400	0.000	100.0
As (390-200 nm)	0.400	0.000	100.0
As (400-200 nm)	0.400	0.000	100.0
As (410-200 nm)	0.400	0.000	100.0
As (420-200 nm)	0.400	0.000	100.0
As (430-200 nm)	0.400	0.000	100.0
As (440-200 nm)	0.400	0.000	100.0
As (450-200 nm)	0.400	0.000	100.0
As (460-200 nm)	0.400	0.000	100.0
As (470-200 nm)	0.400	0.000	100.0
As (480-200 nm)	0.400	0.000	100.0
As (490-200 nm)	0.400	0.000	100.0
As (500-200 nm)	0.400	0.000	100.0
As (510-200 nm)	0.400	0.000	100.0
As (520-200 nm)	0.400	0.000	100.0
As (530-200 nm)	0.400	0.000	100.0
As (540-200 nm)	0.400	0.000	100.0
As (550-200 nm)	0.400	0.000	100.0
As (560-200 nm)	0.400	0.000	100.0
As (570-200 nm)	0.400	0.000	100.0
As (580-200 nm)	0.400	0.000	100.0
As (590-200 nm)	0.400	0.000	100.0
As (600-200 nm)	0.400	0.000	100.0
As (610-200 nm)	0.400	0.000	100.0
As (620-200 nm)	0.400	0.000	100.0
As (630-200 nm)	0.400	0.000	100.0
As (640-200 nm)	0.400	0.000	100.0
As (650-200 nm)	0.400	0.000	100.0
As (660-200 nm)	0.400	0.000	100.0
As (670-200 nm)	0.400	0.000	100.0
As (680-200 nm)	0.400	0.000	100.0
As (690-200 nm)	0.400	0.000	100.0
As (700-200 nm)	0.400	0.000	100.0
As (710-200 nm)	0.400	0.000	100.0
As (720-200 nm)	0.400	0.000	100.0
As (730-200 nm)	0.400	0.000	100.0
As (740-200 nm)	0.400	0.000	100.0
As (750-200 nm)	0.400	0.000	100.0
As (760-200 nm)	0.400	0.000	100.0
As (770-200 nm)	0.400	0.000	100.0
As (780-200 nm)	0.400	0.000	100.0
As (790-200 nm)	0.400	0.000	100.0
As (800-200 nm)	0.400	0.000	100.0
As (810-200 nm)	0.400	0.000	100.0
As (820-200 nm)	0.400	0.000	100.0
As (830-200 nm)	0.400	0.000	100.0
As (840-200 nm)	0.400	0.000	100.0
As (850-200 nm)	0.400	0.000	100.0
As (860-200 nm)	0.400	0.000	100.0
As (870-200 nm)	0.400	0.000	100.0
As (880-200 nm)	0.400	0.000	100.0
As (890-200 nm)	0.400	0.000	100.0
As (900-200 nm)	0.400	0.000	100.0

เอกสารไม่ควบคุม

Predicted Test		Pass
Student		
Elementary Worksheets	Classification	Normalized score to 1000
3a (100-200) req	4.200	0.20
3a (100-200) req	4.200	0.20
2a (112-207) req	4.100	0.40
4a (222-352) req	4.200	0.34
Ma (222-310) req	4.140	0.20
4c (300-182) req	4.100	0.40
3a (445-400) req	4.100	0.20
6 (700-647) req	4.140	0.00
Group		
Elementary Worksheets	Classification	Normalized score to 1000
3a (100-200) req	4.100	0.40
3a (100-200) req	4.100	0.40
2a (100-200) req	4.100	0.40
2a (112-207) req	4.100	0.34
3a (214-400) req	4.100	0.40
7a (222-210) req	4.100	0.20
4a (222-210) req	4.100	0.34
1a (222-270) req	4.100	0.44
3a (224-194) req	4.100	0.00
4c (200-112) req	4.100	0.40
2a (445-400) req	4.100	0.20
6 (700-647) req	4.100	0.00

เอกสารไม่ควบคุม

Report Summary		
Instrument Model	Agilent 1100B1 W/WW/IC/ORD	
Instrument ID	00011000000000	
Instrument Serial Number	M11000000	
Software Version	7.3.1.8527	
Hardware Version	0002	
Tested By	000000000000000000	
Test Completed On	FRI MAR 21 11:00:00 AM	
Result Summary		
Subsystem Communications Test	Pass	
Air Flow Test	Pass	
Water Flow Test	Pass	
Gas Flow Test	Pass	
IC Generator Test	Pass	
Detector Test	Pass	
Utility Test	Skipped	
Heated Vapor System Test	Skipped	
Molecular Flow	Skipped	
Sensitivity Test	Skipped	
Pressure Test	Skipped	
Subsystem Communications Test	Pass	
Air Flow Test	Pass	
20% Air Flow positive control	10% Air Flow positive control	
14.00	20.00	
Water Flow Test	Pass	
50 Water Head Limit	Current Water Flow	Water Flow Temperature
1.27	0.00	00.00

เอกสารไม่ควบคุม

Gas Flow Test			Flow		
Reduction Target Flow	Actual Flow	Back Pressure	Supply Target Flow	Actual Flow	Back Pressure
2.15	0.75	271.62	2.20	0.35	111.15
Return Target Flow	Actual Flow	Back Pressure	Heats Target Flow	Actual Flow	Back Pressure
1.20	2.81	119.00	15.05	17.94	22.17
RF Generator Test			Flow		
RF Power Supply Test	Passed				
RF Power Supply (W)	127.180				
RF Output Test	Passed				
RF Output Frequency (MHz)	38.419				
Work Cell Current (A)	16.412				
RF Power Output Consistency	1.000				
Current Test			Flow		
	Integrative Flow (m)	Standard Deviation	Status		
Electron Output Test	0.00	0.001	Passed		
Gas Current Test	0.00	0.076	Passed		
Water Test	0	0.000	Passed		
Intensity Test		0.116	Passed		

เอกสารไม่ควบคุม

Agilent CrossLab Start Up Services Agilent 7890 Gas Chromatograph Preventive Maintenance Checklist

Agilent CrossLab Management provides Service recommendations services for your additional instruments to ensure reliable operation over the lifetime of your assets.

Approved by a fully trained and certified service engineer using genuine Agilent parts and supplies, Agilent Preventive Maintenance services are offered to customers at a reduced price. This service is available to all customers, regardless of their model. This checklist will be completed at the end of the service and should be retained as a record of the preventive maintenance services.



เอกสารไม่ควบคุม

Introduction

Customer Information

- Customer should provide all necessary operating supplies upon request of the engineer.
- A customer representative should be available to the engineer while performing the preventive maintenance procedures.
- Agilent, not included in the Parts list section of this document, is not part of the recommended Preventive Maintenance service, but are they included in the price of this service.
- If a system requires the use of safety or special procedures and/or parts for the maintenance service, these items must be ordered separately and charged as a repair, whether they are additional tools.

Important Customer Web Links

- For more information about Agilent Technologies services, please visit our website using the following URL: <http://www.agilent.com/service> or contact your local Agilent representative.
- The **Agilent Community** is an excellent place to get answers, collaborate with others about applications, and Agilent products, and find out about the news and what's new to Agilent Technologies. Visit <http://www.agilent.com/community>.
- To receive **Agilent University**, visit <http://www.agilent.com/learning> to receive a catalog of training services, which include online, classroom and on-site training. A training specialist can assist directly with your help, depending on your local options.
- A quick **Agilent Resource Center** web page is available, which includes about 1000+ maintenance, troubleshooting and test methods for over 100 instruments, and other valuable information. Check out the Resource Page here: <http://www.agilent.com/resource-center>.
- Need technical support? Help, support? Visit our **Support Home page** <http://www.agilent.com/support>.
- Values about your preparation requirements for each instrument can be found by searching the Agilent Site using the following URL: <http://www.agilent.com>.
- Health Manuals** are also available on Agilent site:
 - Safety**
http://www.agilent.com/chem/chemicalsafety/7890/7890_Safety.pdf
 - Installation and First Start**
http://www.agilent.com/chem/7890/7890_Installation_and_First_Start.pdf
 - Operation Manual**
http://www.agilent.com/chem/7890/7890_Operation_Manual.pdf
 - Maintaining Your GC**
http://www.agilent.com/chem/7890/7890_Maintaining_Your_GC.pdf

เอกสารไม่ควบคุม

Service Engineer's Responsibilities:

- Contact the customer and ensure that all necessary supplies are available before the preventive maintenance step.
- Verify correct flow rates for the system and that the system is properly calibrated.
- Complete any work with the system in accordance with the instructions.
- Complete the system checklists in the checklist using either a "Y" or "N" for each item.
- Check "Safety and Supplies" which covers the safety and supplies and the system.
- Complete the Preventive Maintenance service in the order of the tasks listed.
- Complete the Service Engineer checklist in the order of the tasks listed.
- Complete the tasks in the order of the tasks listed in the checklist.
- Complete the final number of pages listed in the Service Engineer section.
- Ask the customer to sign the Service Completion section including the customer's and your signatures.

Additional Instruction Notes

- Check for any safety concerns for this job. If there are any, notify the "Safety" or "Maintenance" personnel. Do not proceed until the safety concerns are resolved and before doing any maintenance work.
- Do not perform the service unless you are approved by the customer and you are sure that they are compatible with the instrument's current software.

เอกสารไม่ควบคุม

System Information

- Check the instrument for any safety concerns and the instrument is ready for use.

Instrument System Name and ID	78907890
Instrument System Site and Location	Agilent Technologies
GC System Component Product Numbers	Use the Serial Numbers of each Component
1. GC2400A	78907890
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Preparation

- 1. Check the safety procedures with the customer before starting.
- 2. Verify the instrument is ready for the preventive maintenance of the instrument.
- 3. Verify the instrument system is ready for the preventive maintenance.
- 4. Verify the instrument system is ready for the preventive maintenance.
- 5. Check for any safety concerns of parts, materials, services, etc.
- 6. Check for any safety concerns of parts, materials, services, etc.
- 7. Check for any safety concerns of parts, materials, services, etc.
- 8. Check for any safety concerns of parts, materials, services, etc.
- 9. Check for any safety concerns of parts, materials, services, etc.
- 10. Check for any safety concerns of parts, materials, services, etc.

เอกสารไม่ควบคุม

Preventive Maintenance Procedure

Client and inspect DC

- 10. ☐ **Stakeholder involvement** and **Public participation**
- 11. ☐ **Design** (all issues) and **Implementation** (design and delivery). The policies are important to building trust.
- 12. ☐ **Design** (all issues) and **Implementation** (design and delivery). The policies are important to building trust.
- 13. ☐ **Design** (all issues) and **Implementation** (design and delivery). The policies are important to building trust.
- 14. ☐ **Design** (all issues) and **Implementation** (design and delivery). The policies are important to building trust.
- 15. ☐ **Design** (all issues) and **Implementation** (design and delivery). The policies are important to building trust.
- 16. ☐ **Design** (all issues) and **Implementation** (design and delivery). The policies are important to building trust.
- 17. ☐ **Design** (all issues) and **Implementation** (design and delivery). The policies are important to building trust.
- 18. ☐ **Design** (all issues) and **Implementation** (design and delivery). The policies are important to building trust.
- 19. ☐ **Design** (all issues) and **Implementation** (design and delivery). The policies are important to building trust.
- 20. ☐ **Design** (all issues) and **Implementation** (design and delivery). The policies are important to building trust.

Inlet and Detector consumable replacement

- 1) The first event occurred in 1991 (a) **International Day of Democracy** (b) **1991** (c) **1990** (d) **1989** (e) **1988**
- 2) **1991** (a) **1990** (b) **1989** (c) **1988** (d) **1987** (e) **1986**
- 3) **1991** (a) **1990** (b) **1989** (c) **1988** (d) **1987** (e) **1986**
- 4) **1991** (a) **1990** (b) **1989** (c) **1988** (d) **1987** (e) **1986**
- 5) **1991** (a) **1990** (b) **1989** (c) **1988** (d) **1987** (e) **1986**
- 6) **1991** (a) **1990** (b) **1989** (c) **1988** (d) **1987** (e) **1986**
- 7) **1991** (a) **1990** (b) **1989** (c) **1988** (d) **1987** (e) **1986**
- 8) **1991** (a) **1990** (b) **1989** (c) **1988** (d) **1987** (e) **1986**
- 9) **1991** (a) **1990** (b) **1989** (c) **1988** (d) **1987** (e) **1986**
- 10) **1991** (a) **1990** (b) **1989** (c) **1988** (d) **1987** (e) **1986**

Zero Sensors and Leak test

1. General parameters are (a) the processor is the 486SX "Advanced-Lite-660".

ALS Maintenance

- **Common RCT applications**
- **Effect of holding different postural postures between GZ, prep, with maximum**
- **Neurological outcome and GZ postural stability**
- **Effect of posture on stability**
- **Effect of posture on proprioceptive adaptation**
- **Effect of posture on proprioceptive adaptation**

Identified: 1/14/2007/9/07

- [illegible]

NOTE: If the first factor is unidimensional prior to a bifurcation point, then a single unidimensional procedure is a special case of the bifurcation procedure (see the Appendix for bifurcation procedure).

Signature Page

Service Reviews

- [illegible]

7890 GE Test Results Table

Parameter Name	Reference 1992 Results	Reference 1994 Results
First-order autocorrelation	0.6	0.6
Second-order autocorrelation	0.6	0.6
Third-order autocorrelation	0.6	0.6
Fourth-order autocorrelation	0.6	0.6
First-order partial autocorrelation	0.6	0.6
Second-order partial autocorrelation	0.6	0.6
Third-order partial autocorrelation	0.6	0.6
Fourth-order partial autocorrelation	0.6	0.6

2890 Parts List Table

The following link will automatically fill in the name and target journal title. If this is a special PM and the customer has a preferred set of journal titles, you may use the included recommendations.

Part description	Part number	Product or model when used	Inventory location
016. Capillary with PMMA Substrate	01604-0007	1990A-9	
016. Capillary with PMMA Lens	01604-0006	1990A-9	
016. Capillary (Dry) with metal coated lens with window	01604-0004	1990A-9	
016. Capillary (Dry) with metal coated lens - single layer with (Black film)	01604-0003	1990A-9	
016. Capillary (Dry) with metal coated lens - double layer with (Black film)	01604-0005	1990A-9	
01604-PM 10	01604-0400	1990A-9	
016. Lens - Metalized lens single cartridge (for 016), PTV 8.5	01604-0401	1990A-9	
MM cleaning kit	01604-0000	1990A-9	
PTV Substrate (High Thermal Exp)	01604-0107	1990A-9	
PTV Substrate (High Thermal Exp)	01604-0106	1990A-9	
Temperature (High) - mounting and fixing	01604-0002	1990A-9	
016. Column holder (Cleaning kit)	01604-0108	1990A-9	
01604-0101 and 01604-0102 for capillary 016 lens	01604-0100	1990A-9	
High Temperature (0.1 to 0.2) 01604-0103 for capillary 016 lens	01604-0104	1990A-9	
01604-0105 and 01604-0106 for capillary 016 lens	01604-0107	1990A-9	
01604-0108 and 01604-0109 for capillary 016 lens	01604-0110	1990A-9	
01604-0111 and 01604-0112 for capillary 016 lens	01604-0113	1990A-9	
01604-0114 and 01604-0115 for capillary 016 lens	01604-0116	1990A-9	
01604-0117 and 01604-0118 for capillary 016 lens	01604-0119	1990A-9	
01604-0120 and 01604-0121 for capillary 016 lens	01604-0122	1990A-9	
01604-0123 and 01604-0124 for capillary 016 lens	01604-0125	1990A-9	
01604-0126 and 01604-0127 for capillary 016 lens	01604-0128	1990A-9	
01604-0129 and 01604-0130 for capillary 016 lens	01604-0131	1990A-9	
01604-0132 and 01604-0133 for capillary 016 lens	01604-0134	1990A-9	
01604-0135 and 01604-0136 for capillary 016 lens	01604-0137	1990A-9	
01604-0138 and 01604-0139 for capillary 016 lens	01604-0140	1990A-9	
01604-0141 and 01604-0142 for capillary 016 lens	01604-0143	1990A-9	
01604-0144 and 01604-0145 for capillary 016 lens	01604-0146	1990A-9	
01604-0147 and 01604-0148 for capillary 016 lens	01604-0149	1990A-9	
01604-0150 and 01604-0151 for capillary 016 lens	01604-0152	1990A-9	
01604-0153 and 01604-0154 for capillary 016 lens	01604-0155	1990A-9	
01604-0156 and 01604-0157 for capillary 016 lens	01604-0158	1990A-9	
01604-0159 and 01604-0160 for capillary 016 lens	01604-0161	1990A-9	
01604-0162 and 01604-0163 for capillary 016 lens	01604-0164	1990A-9	
01604-0165 and 01604-0166 for capillary 016 lens	01604-0167	1990A-9	
01604-0168 and 01604-0169 for capillary 016 lens	01604-0170	1990A-9	
01604-0171 and 01604-0172 for capillary 016 lens	01604-0173	1990A-9	
01604-0174 and 01604-0175 for capillary 016 lens	01604-0176	1990A-9	
01604-0177 and 01604-0178 for capillary 016 lens	01604-0179	1990A-9	
01604-0180 and 01604-0181 for capillary 016 lens	01604-0182	1990A-9	
01604-0183 and 01604-0184 for capillary 016 lens	01604-0185	1990A-9	
01604-0186 and 01604-0187 for capillary 016 lens	01604-0188	1990A-9	
01604-0189 and 01604-0190 for capillary 016 lens	01604-0191	1990A-9	
01604-0192 and 01604-0193 for capillary 016 lens	01604-0194	1990A-9	
01604-0195 and 01604-0196 for capillary 016 lens	01604-0197	1990A-9	
01604-0198 and 01604-0199 for capillary 016 lens	01604-0200	1990A-9	

Service Engineer Comments

© 2006 Sony Music Entertainment Inc. All rights reserved. Sony Music Entertainment Inc. is not responsible for the content of any website or for the actions of any user of any website. Sony Music Entertainment Inc. is not responsible for the content of any website or for the actions of any user of any website.

Service Completion

bioRxiv preprint doi: <https://doi.org/10.1101/000488>; this version posted November 11, 2014. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under aCC-BY-NC-ND 4.0 International license.

Admission: _____ Nurse: _____ Discharge: _____

First number of cases in the dataset: 5

Revised: 5.01, based December 05, 2005
 Issue Document Number: J200504
 ID number: 04165, 04173, 04175
 © 2005 Technology, Inc. 2005



เอกสารไม่ควบคุม



Supplement :	(include)
Coveries As Supplement :	(add from)
Reference :	(add reference)
Procedure Used :	

Page No. : 2770000
Page : 1 of 3

That integral is in $\mathcal{H}_1$ (and was found in [15]).

This paper will try to show how the following

Gateways at the point of connection

1. *Hydrocotyle*: dicotyled. *Hydrocotyle*

Document	DocId No.	Cont. No.	Translity	Doc Date
1 - Data Acquisition	4744802002	104442	100	26-06-2004

J. T. H. van den Hul is with the Dept. of Zoology, University of Toronto, Canada.

4. *Flav. xanthopterus* is recorded from the following Indian states:

Noted: 19th. *Terrestrial Mammals* (including *Thylacyn*)

Received 22 November 2005; accepted 12 January 2006

Published by UAGT.

doi:10.1017/S0022292412001702



Estimated calculations		
	Budgeting	Actual
Output (units)	20	20
Materials (kg)	10	9
Cost (pounds)	400	360

Position	1992-1993 Salary
1	\$51,900.00
2	\$51,900.00
3	\$51,900.00
4	\$51,900.00
5	\$51,900.00
6	\$51,900.00
7	\$51,900.00
8	\$51,900.00
9	\$51,900.00

Year	1990	1995	2000
1990	10	10	10
1995	10	10	10
2000	10	10	10

Descriptive of Diagnostics		
D+	0.45	ns
D-	0.55	ns
U+	0.12	ns
U-	0.88	ns

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26



(2014-2015) (2015-2016)
 (2016-2017) (2017-2018)

Received 11 June 2008; accepted 1 April 2009; first published online 15 April 2009

The Government may be a continuous probability of approximately 87%

เอกสารไม่ควบคุม



This journal is an online (print) subscription (vol 175-8)

J. Management Studies 44 (2011) 100–115

ISSUES	REACTING	DATE	STATUS	DATE
1. The first issue is the...	9/14/2012	10/1/12	77%	10/1/12
2. The second issue is the...				
3. The third issue is the...				
4. The fourth issue is the...				
5. The fifth issue is the...				

Resident Committee	() Office, 2nd Floor
Resident of 1007	Telephone 1007
Resident of 1008	Office



Year	1990	1991	1992
1990	1.00	1.00	1.00
1991	1.00	1.00	1.00
1992	1.00	1.00	1.00

Informational support: 5.34

1990	1991	1992
1993	1994	1995
1996	1997	1998
1999	2000	2001
2002	2003	2004
2005	2006	2007
2008	2009	2010
2011	2012	2013
2014	2015	2016
2017	2018	2019
2020	2021	2022
2023	2024	2025
2026	2027	2028
2029	2030	2031
2032	2033	2034
2035	2036	2037
2038	2039	2040
2041	2042	2043
2044	2045	2046
2047	2048	2049
2050	2051	2052
2053	2054	2055
2056	2057	2058
2059	2060	2061
2062	2063	2064
2065	2066	2067
2068	2069	2070
2071	2072	2073
2074	2075	2076
2077	2078	2079
2080	2081	2082
2083	2084	2085
2086	2087	2088
2089	2090	2091
2092	2093	2094
2095	2096	2097
2098	2099	2100
2101	2102	2103
2104	2105	2106
2107	2108	2109
2110	2111	2112
2113	2114	2115
2116	2117	2118
2119	2120	2121
2122	2123	2124
2125	2126	2127
2128	2129	2130
2131	2132	2133
2134	2135	2136
2137	2138	2139
2140	2141	2142
2143	2144	2145
2146	2147	2148
2149	2150	2151
2152	2153	2154
2155	2156	2157
2158	2159	2160
2161	2162	2163
2164	2165	2166
2167	2168	2169
2170	2171	2172
2173	2174	2175
2176	2177	2178
2179	2180	2181
2182	2183	2184
2185	2186	2187
2188	2189	2190
2191	2192	2193
2194	2195	2196
2197	2198	2199
2200	2201	2202
2203	2204	2205
2206	2207	2208
2209	2210	2211
2212	2213	2214
2215	2216	2217
2218	2219	2220
2221	2222	2223
2224	2225	2226
2227	2228	2229
2230	2231	2232
2233	2234	2235
2236	2237	2238
2239	2240	2241
2242	2243	2244
2245	2246	2247
2248	2249	2250
2251	2252	2253
2254	2255	2256
2257	2258	2259
2260	2261	2262
2263	2264	2265
2266	2267	2268
2269	2270	2271
2272	2273	2274
2275	2276	2277
2278	2279	2280
2281	2282	2283
2284	2285	2286
2287	2288	2289
2290	2291	2292
2293	2294	2295
2296	2297	2298
2299	2300	2301
2302	2303	2304
2305	2306	2307
2308	2309	2310
2311	2312	2313
2314	2315	2316
2317	2318	2319
2320	2321	2322

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

	Beginning	End
Population (millions)	24	25
GDP, constant prices (billions of dollars)	10	12
Per capita income (dollars)	417	480

Position	Ref. No.
1	10.100112-2
2	10.100112-2
3	10.100112-2
4	10.100112-2
5	10.100112-2
6	10.100112-2
7	10.100112-2
8	10.100112-2
9	10.100112-2
10	10.100112-2

Prepared: _____ Issued: _____ Date: 01/11/2019
 Certified As Received: _____ Page: 1 of 1

Number of MJT	Temperature Sensor
Power Drivetrain	Coast

[illegible][illegible]

Answer: The number of E-values is not greater.

Independent variables. A list of 145 provided reasons (different of combined independent items) are given. **Independent variables.** The frequency distribution of combined frequencies of all reasons for the observed frequency in the observed column, which are missing in the null test or if it is not a chi-square test is printed to determine the appropriate column is homogeneity with the standard under study data conditions. **Good balance.** The difference of the observed and expected marginal frequencies through degrees of freedom (DOF) = total row frequency.

Note The reported consistency of measurement models will also include global and within-factor

The reported coefficient of determination was based on a standard normally distributed t -value for a two-tailed test of confidence at approximately 95%.

1



Page 1 of 1

Equipment:	Water bath
Manufacturer:	Mettler
Model:	HE114
Serial No.:	11191000
U No.:	111910000000
Submitted by:	United Analytical and Engineering Consultants (India) J. S. Chavhan et al., Maharashtra, Raichur, Bangalore, India Bangalore, India
Location:	Microbiology Laboratory
Received Date:	15 February 2008
Submission Date:	16 February 2008
Ambient Temperature:	(28 ± 1) °C
Relative Humidity:	(55 ± 5) %
Collected by:	United States

Approved By: _____
Approved Signature

18 February 2024

The *Environmetrics* journal is a multidisciplinary journal of applied statistics.

The authors thank Dr. J. A. Roberts for his helpful comments on the manuscript.

เอกสารไม่ควบคุม

เอกสารไม่ควบคุม



Equipment: Water Bath
Condition As Received: Used Item
Reference: JAG-000000-2
Page: 2 of 3
Cert. No.: 347508

Procedure Used:-
Calibration was conducted using a traceable calibration procedure (JAG-0110) based on NIST 8116 according to direct measurement method with Data Acquisition system connected with Inverting Platinum Resistance Thermocouple (IPT).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument: Serial No. Cert. No. Traceable Date Recd.
1 Data Acquisition: JAG-000000-2 JAG-000000-2 ITS-90 27 Feb 2024

2. The certificate is valid only to the item calibrated on date and place of calibration.

3. This certificate is traceable to the International System of Unit.

Remark: IPTA, Thermocouple Precision Association (Thailand - Japan).

Result of Calibration: () Without Adjustment

Position of UUT: Temperature Source

Heat transfer medium used: Water

	Environmental		AC Voltage Supply	
	(V)	(%RH)	(V)	(Hz)
Beginning of Calibration	25	55	220	
Finished of Calibration	25	55	220	

Position:	Ref. No.
1	AGT00000001
2	AGT00000002
3	AGT00000003
4	AGT00000004
5	AGT00000005

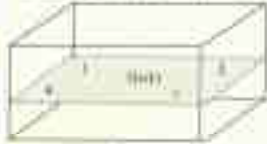


Fig. 1

เอกสารไม่ควบคุม



Equipment: Water Bath
Condition As Received: Used Item
Reference: JAG-000000-2
Page: 3 of 3
Cert. No.: 347508

Calibration point (V)	UUT Setting (V)	UUT Reading (V)	Average Standard Reading (V)					Uncertainty (V)
			1	2	3	4	5 (avg)	
40.5	40.4	40.4	40.526	40.430	40.526	40.521	40.527	0.01

Calibration point (V)	Uncertainty	Stability	Change Factor
40.5	0.10	0.074	0

Average: The average of 50 values in each position.

Uncertainty: The standard difference of measured temperature at any position and the reported temperature at the reference location, which are observed at the same time or at an equal interval that is possible to determine the temperature pattern or homogeneity within the chamber under steady-state condition.

Stability: Check of the gradual variation difference of measured temperature at any one point UUT (1st Class Calibration).

Note: The reported uncertainty of measurement was measured stability and accuracy uniformly.

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

4/10

เอกสารไม่ควบคุม



THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
NATIONAL BUREAU OF STANDARDS (NIST) 100 BUREAU DRIVE
Gaithersburg, Maryland 20899-0100, U.S.A.
Tel: 301-975-3000 Fax: 301-975-2855



Cert. No.: 347508
Page: 1 of 3

Certificate of Calibration

Equipment: Water Bath
Manufacturer: Mettler
Model: 3452 L2
Serial No.: 14143002
ID No.: JAG-000000-2
Submitted by: United Industries Engineering Corporation Co., Ltd.
9 Rue Uthomak-01, Sakthong Road,
Bangkok, Phnom Penh,
Bangkok 12050
Location: Measurement Laboratory
Received Order: 01 February 2024
Calibration Date: 10 February 2024
Ambient Temperature: (24 ± 0.1) °C
Relative Humidity: (50 ± 0.1) %
Calibrated by: Anand Man
Approved by: [Signature]
1. Pichitra Tarayakul
2. Chongsakorn
3. Chaiyaporn

Issue Date: 14 February 2024

This Certificate attests to the calibration performance of approximately 95%.

The calibration is valid for approximately 12 months, subject to the following conditions:

1. The equipment is used in accordance with the intended purpose.

2. The equipment is stored in a controlled environment.

เอกสารไม่ควบคุม



Equipment: Water Bath
Condition As Received: Used Item
Reference: JAG-000000-2
Page: 2 of 3
Cert. No.: 347508

Procedure Used:-
Calibration was conducted using a traceable calibration procedure (JAG-0110) based on NIST 8116 according to direct measurement method with Data Acquisition system connected with Inverting Platinum Resistance Thermocouple (IPT).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument: Serial No. Cert. No. Traceable Date Recd.
1 Data Acquisition: JAG-000000-2 JAG-000000-2 ITS-90 27 Feb 2024

2. The certificate is valid only to the item calibrated on date and place of calibration.

3. This certificate is traceable to the International System of Unit.

Remark: IPTA, Thermocouple Precision Association (Thailand - Japan).

Result of Calibration: () Without Adjustment

Position of UUT: Temperature Source

Heat transfer medium used: Water

	Environmental		AC Voltage Supply	
	(V)	(%RH)	(V)	(Hz)
Beginning of Calibration	25	55	220	
Finished of Calibration	25	55	220	

Position:	Ref. No.
1	AGT00000001
2	AGT00000002
3	AGT00000003
4	AGT00000004
5	AGT00000005

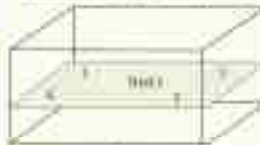


Fig. 1

เอกสารไม่ควบคุม

Calibration Certificate

Certificate No.: 040201-001-01
 Client name: 101/102 ANALYTICAL AND INSTRUMENTAL CONTROL UNIT CO., LTD.
 Address: 330 Sukhumvit 41, Sukhumvit Road,
 Bangkok, Thailand, Bangkok 10110

Page 1 of 2

Equipment: 04040000
 Manufacturer: ALP
 Model: 01-40
 Serial No.: 902799
 ID No.: 100,000,000,000
 Order No.: 040201
 Operation No.: 040201-001
 Date of Receipt: 3 April 2024
 Date of Calibration: 3 April 2024

Calibrated by: Ms. Somsri Pongpattana Approved by: [Signature]
 (Mr. Pongpattana [Signature])

Date of Issue: 3 April 2024

This certificate is for a continuous capability of approximately 90%.
 The certificate is issued in accordance with the provisions of accreditation granted by the Thai Calibration Authority when the laboratory has demonstrated the capability of the laboratory and its equipment to perform the calibration and its results of measurement issued in the accompanying calibration certificate. This certificate may be reproduced and used as a reference for the purpose of the calibration certificate.

Calibration certificate 040201-001-01

เอกสารไม่ควบคุม

Calibration Report

Certificate No.: 040201-001-01
 Equipment: 04040000
 Manufacturer: ALP
 Model: 01-40
 Serial No.: 902799
 ID No.: 100,000,000,000
 Order No.: 040201
 Operation No.: 040201-001
 Date of Receipt: 3 April 2024
 Date of Calibration: 3 April 2024

Page 1 of 2

Location: 101/102 ANALYTICAL AND INSTRUMENTAL CONTROL UNIT CO., LTD.
 Environment Condition:
 Ambient Temperature: 20 ± 1 °C
 Relative Humidity: 50 ± 5 %
 Air velocity: 0.5 ± 0.1 m/s

Statement of the results of Calibration

1. The laboratory has been accredited by the Thai Calibration Authority for the calibration of the equipment and its results of measurement issued in the accompanying calibration certificate. This certificate may be reproduced and used as a reference for the purpose of the calibration certificate.

2. The laboratory has been accredited by the Thai Calibration Authority for the calibration of the equipment and its results of measurement issued in the accompanying calibration certificate. This certificate may be reproduced and used as a reference for the purpose of the calibration certificate.

Equipment	Model	Serial No.	Calibration No.	Due Date	Through
04040000	01-40	902799	040201-001	3 April 2024	040201-001

3. This certificate is issued in accordance with the provisions of accreditation granted by the Thai Calibration Authority when the laboratory has demonstrated the capability of the laboratory and its equipment to perform the calibration and its results of measurement issued in the accompanying calibration certificate. This certificate may be reproduced and used as a reference for the purpose of the calibration certificate.

4. The laboratory has been accredited by the Thai Calibration Authority for the calibration of the equipment and its results of measurement issued in the accompanying calibration certificate. This certificate may be reproduced and used as a reference for the purpose of the calibration certificate.

5. The laboratory has been accredited by the Thai Calibration Authority for the calibration of the equipment and its results of measurement issued in the accompanying calibration certificate. This certificate may be reproduced and used as a reference for the purpose of the calibration certificate.

Calibration certificate 040201-001-01

เอกสารไม่ควบคุม

Calibration Report

Certificate No.: 040201-001-01
 Equipment: 04040000
 Manufacturer: ALP
 Model: 01-40
 Serial No.: 902799
 ID No.: 100,000,000,000
 Order No.: 040201
 Operation No.: 040201-001
 Date of Receipt: 3 April 2024
 Date of Calibration: 3 April 2024

Page 1 of 2

Equipment	Manufacturer	Model	Serial No.	Calibration No.
04040000	ALP	01-40	902799	040201-001



Statement of the results of Calibration

Equipment	Model	Serial No.	Calibration No.	Due Date	Through
04040000	01-40	902799	040201-001	3 April 2024	040201-001

Statement of the results of Calibration

Equipment	Model	Serial No.	Calibration No.	Due Date	Through
04040000	01-40	902799	040201-001	3 April 2024	040201-001

This certificate is for a continuous capability of approximately 90%.
 The certificate is issued in accordance with the provisions of accreditation granted by the Thai Calibration Authority when the laboratory has demonstrated the capability of the laboratory and its equipment to perform the calibration and its results of measurement issued in the accompanying calibration certificate. This certificate may be reproduced and used as a reference for the purpose of the calibration certificate.

Calibration certificate 040201-001-01

เอกสารไม่ควบคุม

Calibration Certificate

Certificate No.: 040201-001-01
 Client name: 101/102 ANALYTICAL AND INSTRUMENTAL CONTROL UNIT CO., LTD.
 Address: 330 Sukhumvit 41, Sukhumvit Road,
 Bangkok, Thailand, Bangkok 10110

Page 1 of 2

Equipment: 04040000
 Manufacturer: ALP
 Model: 01-40
 Serial No.: 902799
 ID No.: 100,000,000,000
 Order No.: 040201
 Operation No.: 040201-001
 Date of Receipt: 3 April 2024
 Date of Calibration: 3 April 2024

Calibrated by: Ms. Somsri Pongpattana Approved by: [Signature]
 (Mr. Pongpattana [Signature])

Date of Issue: 3 April 2024

This certificate is for a continuous capability of approximately 90%.

The certificate is issued in accordance with the provisions of accreditation granted by the Thai Calibration Authority when the laboratory has demonstrated the capability of the laboratory and its equipment to perform the calibration and its results of measurement issued in the accompanying calibration certificate. This certificate may be reproduced and used as a reference for the purpose of the calibration certificate.

Calibration certificate 040201-001-01

เอกสารไม่ควบคุม

