

ภาคผนวก จ

เอกสารการสอบเทียบเครื่องมือตรวจวิเคราะห์



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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Ambient	Total Suspended Particulate	High Volume	RYG_FS0664	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0292	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0396	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_FS0180	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	RYG_EN0001	1-Mar-23	1-Mar-24	12
Ambient	Sulfur Dioxide	SO ₂ Analyzer	RYG_FS0257	2-Jul-23	2-Jan-24	6
Ambient	Sulfur Dioxide	SO ₂ Analyzer	RYG_FS0532	2-Jul-23	2-Jan-24	6
Ambient	Sulfur Dioxide	SO ₂ Analyzer	RYG_FS0263	2-Jul-23	2-Jan-24	6
Ambient	Sulfur Dioxide	SO ₂ Analyzer	RYG_FS0454	2-Jul-23	2-Jan-24	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0551	1-Jul-23	1-Jan-24	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0533	1-Jul-23	1-Jan-24	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_FS0264	1-Jul-23	1-Jan-24	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	BKK_FS1064	1-Jul-23	1-Jan-24	6
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_FS0089	19-Jan-23	19-Jul-24	18
Stack	Oxides of Nitrogen (Instrument Ana	Console Control Unit	BKK_FS0518	13-Jul-23	13-Jan-24	6
Stack	Oxides of Nitrogen (Instrument Ana	Console Control Unit	BKK_FS0556	13-Jul-23	13-Jan-24	6
Stack	Oxides of Nitrogen (Instrument Ana	Flue gas Analyzer	RYG_FS0564	20-Jan-23	20-Jan-24	12
Stack	Oxides of Nitrogen (Instrument Ana	Flue gas Analyzer	RYG_FS0563	28-Dec-22	28-Dec-23	12
Stack	Sulfur Dioxide (Instrument Analyze	Console Control Unit	BKK_FS0518	13-Jul-23	13-Jan-24	6
Stack	Sulfur Dioxide (Instrument Analyze	Console Control Unit	BKK_FS0556	13-Jul-23	13-Jan-24	6
Stack	Sulfur Dioxide (Instrument Analyze	Flue gas Analyzer	RYG_FS0564	20-Jan-23	20-Jan-24	12
Stack	Sulfur Dioxide (Instrument Analyze	Flue gas Analyzer	RYG_FS0563	28-Dec-22	28-Dec-23	12
Stack	Total Suspended Particulate	Console Control Unit	BKK_FS0518	13-Jul-23	13-Jan-24	6
Stack	Total Suspended Particulate	Console Control Unit	BKK_FS0556	13-Jul-23	13-Jan-24	6
Stack	Total Suspended Particulate	Flue gas Analyzer	RYG_FS0564	20-Jan-23	20-Jan-24	12
Stack	Total Suspended Particulate	Flue gas Analyzer	RYG_FS0563	28-Dec-22	28-Dec-23	12
Stack	Total Suspended Particulate	Flue gas Analyzer	RYG_FS0565	28-Dec-22	28-Dec-23	12
Stack	Total Suspended Particulate	Digital Balance	RYG_EN0003	1-Mar-23	1-Mar-24	12
Stack	Copper	Console Control Unit	BKK_FS0556	13-Jul-23	13-Jan-24	6
Stack	Copper	Flue gas Analyzer	RYG_FS0565	28-Dec-22	28-Dec-23	12
Stack	Copper	ICP-OES	BKK_EL0037	20-Mar-23	19-Sep-24	18
Stack	Zinc	Console Control Unit	BKK_FS0556	13-Jul-23	13-Jan-24	6
Stack	Zinc	Flue gas Analyzer	RYG_FS0565	28-Dec-22	28-Dec-23	12
Stack	Zinc	ICP-OES	BKK_EL0037	20-Mar-23	19-Sep-24	18
Stack	Hydrogen Chloride	Console Control Unit	BKK_FS0556	13-Jul-23	13-Jan-24	6
Stack	Hydrogen Chloride	Flue gas Analyzer	RYG_FS0565	28-Dec-22	28-Dec-23	12
Stack	Hydrogen Chloride	Dry Gas	BKK_FS0563	13-Jul-23	13-Jan-24	6
Stack	Hydrogen Chloride	Ion Chromatography	BKK_EN0069	12-Jan-23	12-Jan-24	12
Noise	Leq 24 hrs	Sound Calibrator	RYG_FS0213	26-Jan-23	26-Jan-24	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0020	13-Jan-23	13-Jan-24	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0018	3-Jan-23	3-Jan-24	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0019	13-Jan-23	13-Jan-24	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0022	25-Jan-23	25-Jan-24	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_FS0017	3-Jan-23	3-Jan-24	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_FS0496	17-Jan-23	17-Jan-24	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0622	23-Jan-23	23-Jan-24	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0623	23-Jan-23	23-Jan-24	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0624	23-Jan-23	23-Jan-24	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0625	23-Jan-23	23-Jan-24	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0627	26-Jan-23	26-Jan-24	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0628	26-Jan-23	26-Jan-24	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_FS0629	26-Jan-23	26-Jan-24	12
Noise	Noise Dose, TWA	Dose Badge Reader	RYG_FS0440	5-Jan-23	5-Jan-24	12



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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Workplace	Hydrochloric Acid	Field Rotameter	BKK_FS1042	1-Jul-23	1-Oct-23	3
Workplace	Hydrochloric Acid	Ion Chromatography	BKK_EN0069	12-Jan-23	12-Jan-24	12
Workplace	Total Dust	Field Rotameter	BKK_FS1043	1-Jul-23	1-Oct-23	3
Workplace	Total Dust	Digital Balance	RYG_EN0004	1-Mar-23	1-Mar-24	12
Workplace	Respirable Dust	Field Rotameter	BKK_FS1043	1-Jul-23	1-Oct-23	3
Workplace	Respirable Dust	Digital Balance	RYG_EN0004	1-Mar-23	1-Mar-24	12
Workplace	Copper (Fume)	Field Rotameter	BKK_FS1043	1-Jul-23	1-Oct-23	3
Workplace	Copper (Fume)	ICP-OES	BKK_EL0037	20-Mar-23	19-Sep-24	18
Workplace	Iron (Fume)	Field Rotameter	BKK_FS1043	1-Jul-23	1-Oct-23	3
Workplace	Iron (Fume)	ICP-OES	BKK_EL0037	20-Mar-23	19-Sep-24	18
Workplace	Zinc (Inhalable dust)	Field Rotameter	BKK_FS1043	1-Jul-23	1-Oct-23	3
Workplace	Zinc (Inhalable dust)	ICP-OES	BKK_EL0037	20-Mar-23	19-Sep-24	18
Illuminance	Illuminance	Lux Meter	RYG_FS0474	4-Apr-23	4-Apr-24	12
Heat	Heat Stress	Heat Stress Monitor	RYG_FS0223	3-Feb-23	3-Feb-24	12
Rayong Lab	pH at 25 °C	pH meter	RYG_EN0183	27-Feb-23	27-Feb-24	12
Rayong Lab	BOD	DO meter with Sensor	RYG_EN0140	21-Nov-22	21-May-24	18
Rayong Lab	BOD	Incubator	RYG_EN0154	29-May-23	29-Nov-24	18
Rayong Lab	Total Suspended Solids	Electronic Balance	RYG_EN0002	1-Mar-23	1-Mar-24	12
Rayong Lab	Total Suspended Solids	Hot Air Oven	RYG_EN0010	20-Oct-22	20-Apr-24	18
Rayong Lab	Total Dissolved Solids 180°C	Electronic Balance	RYG_EN0002	1-Mar-23	1-Mar-24	12
Rayong Lab	Total Dissolved Solids 180°C	Hot Air Oven	RYG_EN0010	20-Oct-22	20-Apr-24	18
Rayong Lab	Oil & Grease	Electronic Balance	RYG_EN0002	1-Mar-23	1-Mar-24	12
Rayong Lab	Oil & Grease	Hot Air Oven	RYG_EN0006	20-Oct-22	20-Apr-24	18
Rayong Lab	Oil & Grease	Water Bath	RYG_EN0061	20-Oct-22	20-Apr-24	18
Rayong Lab	Temperature	pH meter	RYG_FS0420	3-Apr-23	3-Apr-24	12
Rayong Lab	COD	Spectrophotometer	RYG_EN0037	18-Sep-23	18-Mar-25	18

MULTIPOINT CALIBRATION REPORT

Calibration Date

1-6-03

Method Name

TOX 100

Method Ref

7238

Calibrator Manufacturer

Stratons Mfg

Serial No.

847

Int. Use Concentration (PPM)

300.00

Cylinder Pressure (Psi)

1000

Certified Date

9-16-02

Equipment Name

NOx Analyzer

Equipment ID

RPV2 / RPV2B3

Model

790

Cylinder No.

GM0027222

Expired By

Agent Inc.

Calibration Test

RPV2-e3-30

CALIBRATION RESULTS

Point	Meas	Added NOx	Error NOx	Added NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	59.50	-40.50	159.10	1.10	1.10
2	200.00	108.75	-91.25	258.25	1.20	0.50
3	300.00	158.00	-142.00	357.00	0.50	0.10
4	400.00	206.00	-194.00	455.00	2.00	0.50
AVERAGE (%)						0.30

Legend: — Data — Added NOx — Measured

Calibrated by

Approved by

(Signature)
(Mr. James Nelson)
Field Environmental Scientist (E)

(Signature)
(Mr. Joseph Albano)
Assistant General Manager

ALS Laboratory Group
FORM NO. 17-06-00 REVISION NO. - 1 ISSUE DATE: 02/02/02

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MANUFACTURING RESULTS

Manufacturing results are reported on a quarterly basis, by category, within the Operating Results. The manufacturing results are reported as a net amount, which is the difference between the cost of goods sold and the cost of goods manufactured. The cost of goods sold is reported as a net amount, which is the difference between the cost of goods sold and the cost of goods manufactured. The cost of goods manufactured is reported as a net amount, which is the difference between the cost of goods manufactured and the cost of goods sold.

Reported mM	Q ₁ Report PT	Q ₂ Report PT	Q ₃ Report PT	Error Report PT	Q ₄ Report PT
	45,000	45,000	45,000	4	45,000
	10,000	10,000	10,000	2	10,000
5.00	100,000	100,000	100,000	0	100,000
	20,000	20,000	20,000	0	20,000
	20,000	20,000	20,000	0	20,000
	20,000	20,000	20,000	1	20,000
	20,000	20,000	20,000	0	20,000

Notes:

1. The manufacturing results are reported on a quarterly basis, by category, within the Operating Results. The manufacturing results are reported as a net amount, which is the difference between the cost of goods sold and the cost of goods manufactured.

Manufacturing results are reported on a quarterly basis, by category, within the Operating Results. The manufacturing results are reported as a net amount, which is the difference between the cost of goods sold and the cost of goods manufactured.

Calibration Certificate

Equipment: SOUNDSKY METER
Model: NS-420
Serial No.: 0122216 / 14342 / 2245
ID No.: RYO P8020

Condition As Found: GOOD
Customer: ASSTABRATORY GROUP (THAI) AND CO., LTD.
104 PHATHANONG 46, PHATHANONG ROAD,
KIWAENG PHATHANONG, KIRT KIAN LAM,
BANGKOK, 10250 THAILAND.

Location: (23.0 ± 0.1) °C
Ambient Temperature: (101.3 ± 0.3) °F
Pressure: (1013 ± 0.3) hPa
Relative Humidity: (50.0 ± 0.3) %

Received Date: 06 JANUARY 2023
Calibration Date: 15-16 JANUARY 2023
Date of Issue: 19 JANUARY 2023

Calibrated by: *T. P. P.*

Approved by: *T. P. P.*

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, any use by the recipient other than that in full, except with the prior written approval of the head of Calibration Laboratory.

Summary of Measurement Results

Parameter	Pin	Full	Uncertainty	Maximum permitted uncertainty (dB)
1. Absolute sensitivity	✓	✓	0.2	0.5
2. Self-generated noise	✓	✓	0.2	0.5
3. Acoustical signal tone of frequency weightings	✓	✓	0.3	0.6
4. External signal tone of frequency weightings	✓	✓	0.3	0.6
5. Frequency and time weightings at 1 kHz	✓	✓	0.3	0.6
6. Long-term stability	✓	✓	0.2	0.5
7. Level repeatability on the reference level range	✓	✓	0.2	0.5
8. Level repeatability on the level range control	✓	✓	0.2	0.5
9. Level repeatability on the level range control	✓	✓	0.2	0.5
10. Level repeatability on the level range control	✓	✓	0.2	0.5
11. Overload indication	✓	✓	0.2	0.5
12. High level stability	✓	✓	0.1	0.1

Calibration Procedure:

Calibration Method:
This equipment was calibrated by using an IEC 61672-2 (2013) Standard for sound level meter (SLM). The SLM has been used in accordance with the requirements of the International Electrotechnical Commission (IEC) Standard Instruments.

For each result of each item were made by observation of each instrument display and also with SLM display.

Condition of this result of calibration:

Indicant	Model	Serial No.	Cert. No.	Exp. Date
Reference Standard Instruments	3310A	MY3220104	MY3220104	09/04/23
Workbench Generator	3346A	MY3220104	MY3220104	09/04/23
Digital Multimeter	3446A	MY3220104	MY3220104	09/04/23
Programmable Acoustical	MAT-1070	6210014	17-009-22	07/04/23
Acoustic Microphone	4108	3460005	AA-3005-22	22/04/23
Measuring Amplifier	NA-420A	3460005	AA-3005-22	22/04/23

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

3. This certificate is valid for the measurement system of your instrument at

3.1 National Institute of Standards and Technology (NIST).

3.2 Thailand Institute of Standards and Technology (TISI).

Result of calibration:

1. Absolute sensitivity

Reference	Measured	Deviation	Link	Acceptance
Acoustic signal	93.9 (dB)	0.0	0.0	±0.3

2. Self-generated noise

Reference	Measured	Deviation	Link	Acceptance
Acoustic signal	93.9 (dB)	0.0	0.0	±0.3

3. Acoustical signal tone of frequency weightings

Frequency (Hz)	Full	C-weight	A-weight	Acceptance
125	0.5	0.5	0.5	±0.3
1000	0.1	0.1	0.1	±0.3
8000	0.1	0.1	0.1	±0.3

4. External signal tone of frequency weightings

Frequency (Hz)	Full	C-weight	A-weight	Acceptance
125	0.5	0.5	0.5	±0.3
1000	0.1	0.1	0.1	±0.3
8000	0.1	0.1	0.1	±0.3

4. External signal tone of frequency weightings

Weighting network response with relative to 1 kHz

Frequency (Hz)	Full	C-weight	A-weight	Acceptance
63	0.0	0.0	0.0	±0.3
125	0.0	0.0	0.0	±0.3
250	0.0	0.0	0.0	±0.3
500	0.0	0.0	0.0	±0.3
1000	0.0	0.0	0.0	±0.3
2000	0.0	0.0	0.0	±0.3
4000	0.0	0.0	0.0	±0.3
8000	0.0	0.0	0.0	±0.3

5. Frequency and time weightings at 1 kHz

Frequency weightings at 1 kHz

Frequency	Measured	Deviation	Acceptance
Frequency	Value	Value	Limit
Weighting	(dB)	(dB)	(dB)
A-weight	94.0	0.0	±0.3
C-weight	94.0	0.0	±0.3
Time	94.0	0.0	±0.3

6. Long-term stability

SLM Display at final

Frequency	Measured	Deviation	Acceptance
Frequency	Value	Value	Limit
Weighting	(dB)	(dB)	(dB)
A-weight	94.0	0.0	±0.3
C-weight	94.0	0.0	±0.3
Time	94.0	0.0	±0.3

8. Level repeatability including the level range control

Weighting network response with relative to 1 kHz

Frequency	Measured	Deviation	Acceptance
Frequency	Value	Value	Limit
Weighting	(dB)	(dB)	(dB)
A-weight	94.0	0.0	±0.3
C-weight	94.0	0.0	±0.3
Time	94.0	0.0	±0.3

9. Time level response

Weighting network response with relative to 1 kHz

Time	Measured	Deviation	Acceptance
Time	Value	Value	Limit
Weighting	(dB)	(dB)	(dB)
A-weight	94.0	0.0	±0.3
C-weight	94.0	0.0	±0.3
Time	94.0	0.0	±0.3

10. Peak C-weight level

Weighting network response with relative to 1 kHz

Frequency	Measured	Deviation	Acceptance
Frequency	Value	Value	Limit
Weighting	(dB)	(dB)	(dB)
A-weight	94.0	0.0	±0.3
C-weight	94.0	0.0	±0.3
Time	94.0	0.0	±0.3

11. Overload indication

Weighting network response with relative to 1 kHz

Frequency	Measured	Deviation	Acceptance
Frequency	Value	Value	Limit
Weighting	(dB)	(dB)	(dB)
A-weight	94.0	0.0	±0.3
C-weight	94.0	0.0	±0.3
Time	94.0	0.0	±0.3

12. High level stability

Weighting network response with relative to 1 kHz

Frequency	Measured	Deviation	Acceptance
Frequency	Value	Value	Limit
Weighting	(dB)	(dB)	(dB)
A-weight	94.0	0.0	±0.3
C-weight	94.0	0.0	±0.3
Time	94.0	0.0	±0.3

13. Level repeatability

Weighting network response with relative to 1 kHz

Frequency	Measured	Deviation	Acceptance
Frequency	Value	Value	Limit
Weighting	(dB)	(dB)	(dB)
A-weight	94.0	0.0	±0.3
C-weight	94.0	0.0	±0.3
Time	94.0	0.0	±0.3

11. Overload indication

Weighting network response with relative to 1 kHz

Frequency	Measured	Deviation	Acceptance
Frequency	Value	Value	Limit
Weighting	(dB)	(dB)	(dB)
A-weight	94.0	0.0	±0.3
C-weight	94.0	0.0	±0.3
Time	94.0	0.0	±0.3

12. High level stability

Weighting network response with relative to 1 kHz

Frequency	Measured	Deviation	Acceptance
Frequency	Value	Value	Limit
Weighting	(dB)	(dB)	(dB)
A-weight	94.0	0.0	±0.3
C-weight	94.0	0.0	±0.3
Time	94.0	0.0	±0.3

13. Level repeatability

Weighting network response with relative to 1 kHz

Frequency	Measured	Deviation	Acceptance
Frequency	Value	Value	Limit
Weighting	(dB)	(dB)	(dB)
A-weight	94.0	0.0	±0.3
C-weight	94.0	0.0	±0.3
Time	94.0	0.0	±0.3



SITHIPORN ASSOCIATES CO., LTD.

8550518185

475-42133 (Bangkok), 475-42133 (Nonthaburi), 475-42133 (Pathum Thani), 475-42133 (Samut Prakan), 475-42133 (Songkhro), 475-42133 (Udon Thani), 475-42133 (Yamlo).

Calibration Certificate

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Equipment : SENSORS (VNI 1001)
Model : NI-42 (Sensors) (VNI 1001)
Serial No. : 0122378 (14340) (242)
HW No. : RYD T50017

Condition As Found : GOOD

Customer : A.S. LABORATORY GROUP (THAI) ANDH CO., LTD.
104 PHATHANAKAN (4) PHATHANAKAN ROAD
KIANGKONG PHATHANAKAN KMITT KUN (LAKSA)
BANGKOK, 10250 THAILAND

Location : (23.0 ± 0.3) °C
(10.2 ± 0.1) °C
(5.0 ± 0.1) °C

Pressure : 1013.25 hPa
Relative Humidity : 50%

Received Date : 14 DECEMBER 2022
Calibration Date : 05-06 JANUARY 2023
Date of Issue : 06 JANUARY 2023

Calibrated by : *T. Pich*
Approved by : *(Thailand) Pichan*

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced either in full or in part, except with the prior written approval of the head of Calibration Laboratory.

Summary of Measurements Result.

Parameter	Unit	Value	Uncertainty	Maximum permitted uncertainty of measurement (dB)
1. Absolute stability	dB	-0.2	0.2	0.5
2. Absolute stability	dB	-0.2	0.2	0.5
3. Absolute stability	dB	-0.2	0.2	0.5
4. Electrical signal rate of frequency weighting	dB	-0.2	0.2	0.5
5. Frequency and time weighting at 1 Hz	dB	-0.2	0.2	0.5
6. Long-term stability	dB	-0.2	0.2	0.5
7. Level stability in the reference level range	dB	-0.2	0.2	0.5
8. Level stability in the level range control	dB	-0.2	0.2	0.5
9. Level stability in the level range control	dB	-0.2	0.2	0.5
10. Level stability in the level range control	dB	-0.2	0.2	0.5
11. Overload indicator	dB	-0.2	0.2	0.5
12. High level stability	dB	-0.2	0.2	0.5

Calibration Certificate

Equipment : SENSORS (VNI 1001)
Model : NI-42 (Sensors) (VNI 1001)
Serial No. : 0122378 (14340) (242)
HW No. : RYD T50017

Condition As Found : GOOD

Customer : A.S. LABORATORY GROUP (THAI) ANDH CO., LTD.
104 PHATHANAKAN (4) PHATHANAKAN ROAD
KIANGKONG PHATHANAKAN KMITT KUN (LAKSA)
BANGKOK, 10250 THAILAND

Location : (23.0 ± 0.3) °C
(10.2 ± 0.1) °C
(5.0 ± 0.1) °C

Pressure : 1013.25 hPa
Relative Humidity : 50%

Received Date : 14 DECEMBER 2022
Calibration Date : 05-06 JANUARY 2023
Date of Issue : 06 JANUARY 2023

Calibrated by : *T. Pich*
Approved by : *(Thailand) Pichan*

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Calibration Certificate

Parameter	Unit	Value	Uncertainty	Maximum permitted uncertainty of measurement (dB)
1. Absolute stability	dB	-0.2	0.2	0.5
2. Absolute stability	dB	-0.2	0.2	0.5
3. Absolute stability	dB	-0.2	0.2	0.5
4. Electrical signal rate of frequency weighting	dB	-0.2	0.2	0.5
5. Frequency and time weighting at 1 Hz	dB	-0.2	0.2	0.5
6. Long-term stability	dB	-0.2	0.2	0.5
7. Level stability in the reference level range	dB	-0.2	0.2	0.5
8. Level stability in the level range control	dB	-0.2	0.2	0.5
9. Level stability in the level range control	dB	-0.2	0.2	0.5
10. Level stability in the level range control	dB	-0.2	0.2	0.5
11. Overload indicator	dB	-0.2	0.2	0.5
12. High level stability	dB	-0.2	0.2	0.5

Calibration Certificate

Equipment : SENSORS (VNI 1001)
Model : NI-42 (Sensors) (VNI 1001)
Serial No. : 0122378 (14340) (242)
HW No. : RYD T50017

Condition As Found : GOOD

Customer : A.S. LABORATORY GROUP (THAI) ANDH CO., LTD.
104 PHATHANAKAN (4) PHATHANAKAN ROAD
KIANGKONG PHATHANAKAN KMITT KUN (LAKSA)
BANGKOK, 10250 THAILAND

Location : (23.0 ± 0.3) °C
(10.2 ± 0.1) °C
(5.0 ± 0.1) °C

Pressure : 1013.25 hPa
Relative Humidity : 50%

Received Date : 14 DECEMBER 2022
Calibration Date : 05-06 JANUARY 2023
Date of Issue : 06 JANUARY 2023

Calibrated by : *T. Pich*
Approved by : *(Thailand) Pichan*

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Calibration Certificate

Parameter	Unit	Value	Uncertainty	Maximum permitted uncertainty of measurement (dB)
1. Absolute stability	dB	-0.2	0.2	0.5
2. Absolute stability	dB	-0.2	0.2	0.5
3. Absolute stability	dB	-0.2	0.2	0.5
4. Electrical signal rate of frequency weighting	dB	-0.2	0.2	0.5
5. Frequency and time weighting at 1 Hz	dB	-0.2	0.2	0.5
6. Long-term stability	dB	-0.2	0.2	0.5
7. Level stability in the reference level range	dB	-0.2	0.2	0.5
8. Level stability in the level range control	dB	-0.2	0.2	0.5
9. Level stability in the level range control	dB	-0.2	0.2	0.5
10. Level stability in the level range control	dB	-0.2	0.2	0.5
11. Overload indicator	dB	-0.2	0.2	0.5
12. High level stability	dB	-0.2	0.2	0.5

Calibration Certificate

Equipment : SENSORS (VNI 1001)
Model : NI-42 (Sensors) (VNI 1001)
Serial No. : 0122378 (14340) (242)
HW No. : RYD T50017

Condition As Found : GOOD

Customer : A.S. LABORATORY GROUP (THAI) ANDH CO., LTD.
104 PHATHANAKAN (4) PHATHANAKAN ROAD
KIANGKONG PHATHANAKAN KMITT KUN (LAKSA)
BANGKOK, 10250 THAILAND

Location : (23.0 ± 0.3) °C
(10.2 ± 0.1) °C
(5.0 ± 0.1) °C

Pressure : 1013.25 hPa
Relative Humidity : 50%

Received Date : 14 DECEMBER 2022
Calibration Date : 05-06 JANUARY 2023
Date of Issue : 06 JANUARY 2023

Calibrated by : *T. Pich*
Approved by : *(Thailand) Pichan*

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced either in full or in part, except with the prior written approval of the head of Calibration Laboratory.

Calibration Certificate

Parameter	Unit	Value	Uncertainty	Maximum permitted uncertainty of measurement (dB)
1. Absolute stability	dB	-0.2	0.2	0.5
2. Absolute stability	dB	-0.2	0.2	0.5
3. Absolute stability	dB	-0.2	0.2	0.5
4. Electrical signal rate of frequency weighting	dB	-0.2	0.2	0.5
5. Frequency and time weighting at 1 Hz	dB	-0.2	0.2	0.5
6. Long-term stability	dB	-0.2	0.2	0.5
7. Level stability in the reference level range	dB	-0.2	0.2	0.5
8. Level stability in the level range control	dB	-0.2	0.2	0.5
9. Level stability in the level range control	dB	-0.2	0.2	0.5
10. Level stability in the level range control	dB	-0.2	0.2	0.5
11. Overload indicator	dB	-0.2	0.2	0.5
12. High level stability	dB	-0.2	0.2	0.5

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Continuation of Calibration Certificate

Cert. No. : ACL30074
Job No. : YC6AC0829
Pages : 7 of 8

8. Level linearity including the level range control

Range	Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Auto	84.0	84.0	0.0	±0.3

Time	Two tone test frequency (Hz)	Cycle	Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Weighting	0.25	1	108.0	107.9	-0.1	±1.5, ±0.6
Flat	2	8	117.0	117.0	0.0	±1.0, ±2.5
200	897	8	134.0	134.1	0.1	±1.0
Slow	20	8	108.0	108.0	0.0	±1.5, ±0.6
80	897	8	134.0	134.0	0.0	±1.0
800	897	8	134.0	134.0	0.0	±1.0
SSR	2	8	108.0	108.0	0.0	±1.5, ±0.6
200	800	800	128.0	128.1	0.1	±1.0

10. Peak C-until level

Number of Cycle	Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Continues	133.0	133.0	0.0	-
One	134.4	134.0	-0.4	±2.0

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7. P.B.A.

SITHIPORN / SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL30075
Job No. : YC6AC0829
Pages : 8 of 8

7. Level linearity on the reference level range

Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±0.3
138.0	138.0	0.0	±0.3
139.0	139.0	0.0	±0.3
140.0	140.0	0.0	±0.3
141.0	141.0	0.0	±0.3
142.0	142.0	0.0	±0.3
143.0	143.0	0.0	±0.3
144.0	144.0	0.0	±0.3
145.0	145.0	0.0	±0.3
146.0	146.0	0.0	±0.3
147.0	147.0	0.0	±0.3
148.0	148.0	0.0	±0.3
149.0	149.0	0.0	±0.3
150.0	150.0	0.0	±0.3
151.0	151.0	0.0	±0.3
152.0	152.0	0.0	±0.3
153.0	153.0	0.0	±0.3
154.0	154.0	0.0	±0.3
155.0	155.0	0.0	±0.3
156.0	156.0	0.0	±0.3
157.0	157.0	0.0	±0.3
158.0	158.0	0.0	±0.3
159.0	159.0	0.0	±0.3
160.0	160.0	0.0	±0.3
161.0	161.0	0.0	±0.3
162.0	162.0	0.0	±0.3
163.0	163.0	0.0	±0.3
164.0	164.0	0.0	±0.3
165.0	165.0	0.0	±0.3
166.0	166.0	0.0	±0.3
167.0	167.0	0.0	±0.3
168.0	168.0	0.0	±0.3
169.0	169.0	0.0	±0.3
170.0	170.0	0.0	±0.3
171.0	171.0	0.0	±0.3
172.0	172.0	0.0	±0.3
173.0	173.0	0.0	±0.3
174.0	174.0	0.0	±0.3
175.0	175.0	0.0	±0.3
176.0	176.0	0.0	±0.3
177.0	177.0	0.0	±0.3
178.0	178.0	0.0	±0.3
179.0	179.0	0.0	±0.3
180.0	180.0	0.0	±0.3
181.0	181.0	0.0	±0.3
182.0	182.0	0.0	±0.3
183.0	183.0	0.0	±0.3
184.0	184.0	0.0	±0.3
185.0	185.0	0.0	±0.3
186.0	186.0	0.0	±0.3
187.0	187.0	0.0	±0.3
188.0	188.0	0.0	±0.3
189.0	189.0	0.0	±0.3
190.0	190.0	0.0	±0.3
191.0	191.0	0.0	±0.3
192.0	192.0	0.0	±0.3
193.0	193.0	0.0	±0.3
194.0	194.0	0.0	±0.3
195.0	195.0	0.0	±0.3
196.0	196.0	0.0	±0.3
197.0	197.0	0.0	±0.3
198.0	198.0	0.0	±0.3
199.0	199.0	0.0	±0.3
200.0	200.0	0.0	±0.3

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7. P.B.A.

SITHIPORN ASSOCIATES CO.,LTD.
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL30075
Job No. : YC6AC0829
Pages : 8 of 8

Calibration Certificate

Equipment : SENSLEVEL METER
Manufacturer : BERN
Model : NL 52A - Microphones (C 29) Pre-amplifier N1 25
Serial No. : 0000003 / 2107 / 2222
Date of Issue : 23 JAN 2023

Condition At Found : (dB)
Customer : A.S. LABORATORY GROUP (THAILAND) CO., LTD.
KAPASRI PHATTANAKAN, KERTSUNG, LUNG, BANGKOK, 10250 THAILAND.

Location : (dB)
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %
Reference Date : 23 JAN 2023
Date of Issue : 23 JAN 2023

Calibrated by : (Signature)
Approved by : (Signature)
(Thailand) (Permit)

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7. P.B.A.

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CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACL30075
Job No. : YC6AC0829
Pages : 8 of 8

11. Overload immunity

Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±0.3
138.0	138.0	0.0	±0.3
139.0	139.0	0.0	±0.3
140.0	140.0	0.0	±0.3
141.0	141.0	0.0	±0.3
142.0	142.0	0.0	±0.3
143.0	143.0	0.0	±0.3
144.0	144.0	0.0	±0.3
145.0	145.0	0.0	±0.3
146.0	146.0	0.0	±0.3
147.0	147.0	0.0	±0.3
148.0	148.0	0.0	±0.3
149.0	149.0	0.0	±0.3
150.0	150.0	0.0	±0.3
151.0	151.0	0.0	±0.3
152.0	152.0	0.0	±0.3
153.0	153.0	0.0	±0.3
154.0	154.0	0.0	±0.3
155.0	155.0	0.0	±0.3
156.0	156.0	0.0	±0.3
157.0	157.0	0.0	±0.3
158.0	158.0	0.0	±0.3
159.0	159.0	0.0	±0.3
160.0	160.0	0.0	±0.3
161.0	161.0	0.0	±0.3
162.0	162.0	0.0	±0.3
163.0	163.0	0.0	±0.3
164.0	164.0	0.0	±0.3
165.0	165.0	0.0	±0.3
166.0	166.0	0.0	±0.3
167.0	167.0	0.0	±0.3
168.0	168.0	0.0	±0.3
169.0	169.0	0.0	±0.3
170.0	170.0	0.0	±0.3
171.0	171.0	0.0	±0.3
172.0	172.0	0.0	±0.3
173.0	173.0	0.0	±0.3
174.0	174.0	0.0	±0.3
175.0	175.0	0.0	±0.3
176.0	176.0	0.0	±0.3
177.0	177.0	0.0	±0.3
178.0	178.0	0.0	±0.3
179.0	179.0	0.0	±0.3
180.0	180.0	0.0	±0.3
181.0	181.0	0.0	±0.3
182.0	182.0	0.0	±0.3
183.0	183.0	0.0	±0.3
184.0	184.0	0.0	±0.3
185.0	185.0	0.0	±0.3
186.0	186.0	0.0	±0.3
187.0	187.0	0.0	±0.3
188.0	188.0	0.0	±0.3
189.0	189.0	0.0	±0.3
190.0	190.0	0.0	±0.3
191.0	191.0	0.0	±0.3
192.0	192.0	0.0	±0.3
193.0	193.0	0.0	±0.3
194.0	194.0	0.0	±0.3
195.0	195.0	0.0	±0.3
196.0	196.0	0.0	±0.3
197.0	197.0	0.0	±0.3
198.0	198.0	0.0	±0.3
199.0	199.0	0.0	±0.3
200.0	200.0	0.0	±0.3

12. High level stability

Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±0.3
138.0	138.0	0.0	±0.3
139.0	139.0	0.0	±0.3
140.0	140.0	0.0	±0.3
141.0	141.0	0.0	±0.3
142.0	142.0	0.0	±0.3
143.0	143.0	0.0	±0.3
144.0	144.0	0.0	±0.3
145.0	145.0	0.0	±0.3
146.0	146.0	0.0	±0.3
147.0	147.0	0.0	±0.3
148.0	148.0	0.0	±0.3
149.0	149.0	0.0	±0.3
150.0	150.0	0.0	±0.3
151.0	151.0	0.0	±0.3
152.0	152.0	0.0	±0.3
153.0	153.0	0.0	±0.3
154.0	154.0	0.0	±0.3
155.0	155.0	0.0	±0.3
156.0	156.0	0.0	±0.3
157.0	157.0	0.0	±0.3
158.0	158.0	0.0	±0.3
159.0	159.0	0.0	±0.3
160.0	160.0	0.0	±0.3
161.0	161.0	0.0	±0.3
162.0	162.0	0.0	±0.3
163.0	163.0	0.0	±0.3
164.0	164.0	0.0	±0.3
165.0	165.0	0.0	±0.3
166.0	166.0	0.0	±0.3
167.0	167.0	0.0	±0.3
168.0	168.0	0.0	±0.3
169.0	169.0	0.0	±0.3
170.0	170.0	0.0	±0.3
171.0	171.0	0.0	±0.3
172.0	172.0	0.0	±0.3
173.0	173.0	0.0	±0.3
174.0	174.0	0.0	±0.3
175.0	175.0	0.0	±0.3
176.0	176.0	0.0	±0.3
177.0	177.0	0.0	±0.3
178.0	178.0	0.0	±0.3
179.0	179.0	0.0	±0.3
180.0	180.0	0.0	±0.3
181.0	181.0	0.0	±0.3
182.0	182.0	0.0	±0.3
183.0	183.0	0.0	±0.3
184.0	184.0	0.0	±0.3
185.0	185.0	0.0	±0.3
186.0	186.0	0.0	±0.3
187.0	187.0	0.0	±0.3
188.0	188.0	0.0	±0.3
189.0	189.0	0.0	±0.3
190.0	190.0	0.0	±0.3
191.0	191.0	0.0	±0.3
192.0	192.0	0.0	±0.3
193.0	193.0	0.0	±0.3
194.0	194.0	0.0	±0.3
195.0	195.0	0.0	±0.3
196.0	196.0	0.0	±0.3
197.0	197.0	0.0	±0.3
198.0	198.0	0.0	±0.3
199.0	199.0	0.0	±0.3
200.0	200.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k = 2, on any value following calculation providing a level of confidence of approximately 95%.

End of Calibration Certificate

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7. P.B.A.

SITHIPORN / SITHIPORN ASSOCIATES CO.,LTD.
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Continuation of Calibration Certificate

Cert. No. : ACL30075
Job No. : YC6AC0829
Pages : 3 of 8

Summary of Measurement Result:

Parameter	Unit	Uncertainty (dB)	Maximum-permitted uncertainty (dB)
1. Absolute stability	-	-	-
2. Level linearity	-	-	-
3. Overload immunity	-	-	-
4. Frequency and time stability	-	-	-
5. Frequency and time stability	-	-	-
6. Frequency and time stability	-	-	-
7. Frequency and time stability	-	-	-
8. Frequency and time stability	-	-	-
9. Frequency and time stability	-	-	-
10. Frequency and time stability	-	-	-
11. Frequency and time stability	-	-	-
12. Frequency and time stability	-	-	-

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7. P.B.A.

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Continuation of Calibration Certificate

Cert. No. : ACL30075
Job No. : YC6AC0829
Pages : 4 of 8

4. Electrical signal level of frequency weighting

Cert. No. : ACL23076
Job No. : VCM4C0009
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits
Auto	84.0	84.0	0.0	±0.5

Time	Time burst duration (s)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits
Weighting	0.25	1	106.0	107.5	0.1	±1.5, ±0.0
Flat	2	4	117.0	117.0	0.0	±1.0, ±2.5
Slow	20	8	134.0	134.0	0.0	±1.0, ±1.0
Fast	20	8	108.0	108.0	0.0	±1.5, ±0.0
8SL	2	2	108.0	108.0	0.0	±1.5, ±2.5

10. Peak to sound level

Number of cycle in test signal (vertical lines)	Anticipated Value (dB)	Measured Value, Logsk (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Weighting	135.4	135.4	0.0	±1.0
One	135.4	135.2	-0.2	±2.0

Number of cycle In test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
Positive half cycle	135.4	135.2	-0.2	-1.0
Negative half cycle	135.4	135.2	-0.2	+1.0

QP-152-04-02064

7. Bb...

Cert. No. : ACL23076
Job No. : VCM4C0009
Pages : 8 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits
177.0	177.1	0.1	±0.5
136.0	136.1	0.1	±0.5
133.0	133.1	0.1	±0.5
131.0	131.1	0.1	±0.5
129.0	129.1	0.1	±0.5
127.0	127.1	0.1	±0.5
125.0	125.1	0.1	±0.5
123.0	123.1	0.1	±0.5
121.0	121.1	0.1	±0.5
119.0	119.1	0.1	±0.5
117.0	117.1	0.1	±0.5
115.0	115.1	0.1	±0.5
113.0	113.1	0.1	±0.5
111.0	111.1	0.1	±0.5
109.0	109.1	0.1	±0.5
107.0	107.1	0.1	±0.5
105.0	105.1	0.1	±0.5
103.0	103.1	0.1	±0.5
101.0	101.1	0.1	±0.5
99.0	99.1	0.1	±0.5
97.0	97.1	0.1	±0.5
95.0	95.1	0.1	±0.5
93.0	93.1	0.1	±0.5
91.0	91.1	0.1	±0.5
89.0	89.1	0.1	±0.5
87.0	87.1	0.1	±0.5
85.0	85.1	0.1	±0.5
83.0	83.1	0.1	±0.5
81.0	81.1	0.1	±0.5
79.0	79.1	0.1	±0.5
77.0	77.1	0.1	±0.5
75.0	75.1	0.1	±0.5
73.0	73.1	0.1	±0.5
71.0	71.1	0.1	±0.5
69.0	69.1	0.1	±0.5
67.0	67.1	0.1	±0.5
65.0	65.1	0.1	±0.5
63.0	63.1	0.1	±0.5
61.0	61.1	0.1	±0.5
59.0	59.1	0.1	±0.5
57.0	57.1	0.1	±0.5
55.0	55.1	0.1	±0.5
53.0	53.1	0.1	±0.5
51.0	51.1	0.1	±0.5
49.0	49.1	0.1	±0.5
47.0	47.1	0.1	±0.5
45.0	45.1	0.1	±0.5
43.0	43.1	0.1	±0.5
41.0	41.1	0.1	±0.5
39.0	39.1	0.1	±0.5
37.0	37.1	0.1	±0.5
35.0	35.1	0.1	±0.5
33.0	33.1	0.1	±0.5
31.0	31.1	0.1	±0.5
29.0	29.1	0.1	±0.5
27.0	27.1	0.1	±0.5
25.0	25.1	0.1	±0.5
23.0	23.1	0.1	±0.5
21.0	21.1	0.1	±0.5
19.0	19.1	0.1	±0.5
17.0	17.1	0.1	±0.5
15.0	15.1	0.1	±0.5
13.0	13.1	0.1	±0.5
11.0	11.1	0.1	±0.5
9.0	9.1	0.1	±0.5
7.0	7.1	0.1	±0.5
5.0	5.1	0.1	±0.5
3.0	3.1	0.1	±0.5
1.0	1.1	0.1	±0.5

QP-152-04-02064

7. Bb...

Cert. No. : ACL23077
Job No. : VCM4C0009
Pages : 1 of 8

Calibration Certificate

Equipment :
Manufacturer :
Model :
Serial No. :
ID No. :
Conditions As Found :
Customer :
Location :
Ambient Temperature :
Pressure :
Relative Humidity :
Revised Date :
Calibration Due :
Date of Issue :SITHIPORN ASSOCIATES CO.LTD
CALIBRATION LABORATORY
151/41/11 Sukhumvit Rd, Bangkok, Bangkok 10110 THAILAND
Tel: 02-251-8600 Fax: 02-251-8609 Email: sithiporn@thai.com
Website: www.sithiporn.comSITHIPORN ASSOCIATES CO.LTD
CALIBRATION LABORATORY
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Tel: 02-251-8600 Fax: 02-251-8609 Email: sithiporn@thai.com
Website: www.sithiporn.comCert. No. : ACL23077
Job No. : VCM4C0009
Pages : 2 of 8

11. Overload indication

Positive	Negative	Acceptance
89.6	89.7	±1.5

12. High level stability

Frequency weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)
A-weight	117.0	117.0	0.0

The reported accuracy is based on a standard uncertainty multiplied by coverage factor k = 2
or any value following which provides a level of confidence of approximately 95%

End of Calibration Certificate

QP-152-04-02064

7. Bb...

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Job No.: VCMAC008
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8. Level linearity including the level range control

Range	Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±0.5

Time	Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
1.200	120.0	120.0	0.0	±0.5
1.310	131.0	131.0	0.0	±0.5
1.420	142.0	142.0	0.0	±0.5
1.530	153.0	153.0	0.0	±0.5
1.640	164.0	164.0	0.0	±0.5
1.750	175.0	175.0	0.0	±0.5
1.860	186.0	186.0	0.0	±0.5
1.970	197.0	197.0	0.0	±0.5
2.080	208.0	208.0	0.0	±0.5
2.190	219.0	219.0	0.0	±0.5
2.300	230.0	230.0	0.0	±0.5
2.410	241.0	241.0	0.0	±0.5
2.520	252.0	252.0	0.0	±0.5
2.630	263.0	263.0	0.0	±0.5
2.740	274.0	274.0	0.0	±0.5
2.850	285.0	285.0	0.0	±0.5
2.960	296.0	296.0	0.0	±0.5
3.070	307.0	307.0	0.0	±0.5
3.180	318.0	318.0	0.0	±0.5
3.290	329.0	329.0	0.0	±0.5
3.400	340.0	340.0	0.0	±0.5
3.510	351.0	351.0	0.0	±0.5
3.620	362.0	362.0	0.0	±0.5
3.730	373.0	373.0	0.0	±0.5
3.840	384.0	384.0	0.0	±0.5
3.950	395.0	395.0	0.0	±0.5
4.060	406.0	406.0	0.0	±0.5
4.170	417.0	417.0	0.0	±0.5
4.280	428.0	428.0	0.0	±0.5
4.390	439.0	439.0	0.0	±0.5
4.500	450.0	450.0	0.0	±0.5
4.610	461.0	461.0	0.0	±0.5
4.720	472.0	472.0	0.0	±0.5
4.830	483.0	483.0	0.0	±0.5
4.940	494.0	494.0	0.0	±0.5
5.050	505.0	505.0	0.0	±0.5
5.160	516.0	516.0	0.0	±0.5
5.270	527.0	527.0	0.0	±0.5
5.380	538.0	538.0	0.0	±0.5
5.490	549.0	549.0	0.0	±0.5
5.600	560.0	560.0	0.0	±0.5
5.710	571.0	571.0	0.0	±0.5
5.820	582.0	582.0	0.0	±0.5
5.930	593.0	593.0	0.0	±0.5
6.040	604.0	604.0	0.0	±0.5
6.150	615.0	615.0	0.0	±0.5
6.260	626.0	626.0	0.0	±0.5
6.370	637.0	637.0	0.0	±0.5
6.480	648.0	648.0	0.0	±0.5
6.590	659.0	659.0	0.0	±0.5
6.700	670.0	670.0	0.0	±0.5
6.810	681.0	681.0	0.0	±0.5
6.920	692.0	692.0	0.0	±0.5
7.030	703.0	703.0	0.0	±0.5
7.140	714.0	714.0	0.0	±0.5
7.250	725.0	725.0	0.0	±0.5
7.360	736.0	736.0	0.0	±0.5
7.470	747.0	747.0	0.0	±0.5
7.580	758.0	758.0	0.0	±0.5
7.690	769.0	769.0	0.0	±0.5
7.800	780.0	780.0	0.0	±0.5
7.910	791.0	791.0	0.0	±0.5
8.020	802.0	802.0	0.0	±0.5
8.130	813.0	813.0	0.0	±0.5
8.240	824.0	824.0	0.0	±0.5
8.350	835.0	835.0	0.0	±0.5
8.460	846.0	846.0	0.0	±0.5
8.570	857.0	857.0	0.0	±0.5
8.680	868.0	868.0	0.0	±0.5
8.790	879.0	879.0	0.0	±0.5
8.900	890.0	890.0	0.0	±0.5
9.010	901.0	901.0	0.0	±0.5
9.120	912.0	912.0	0.0	±0.5
9.230	923.0	923.0	0.0	±0.5
9.340	934.0	934.0	0.0	±0.5
9.450	945.0	945.0	0.0	±0.5
9.560	956.0	956.0	0.0	±0.5
9.670	967.0	967.0	0.0	±0.5
9.780	978.0	978.0	0.0	±0.5
9.890	989.0	989.0	0.0	±0.5
10.000	1000.0	1000.0	0.0	±0.5

9. Peak level linearity

Number of Cycles	Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
1	135.4	135.4	0.0	±0.5
2	135.4	135.4	0.0	±0.5
3	135.4	135.4	0.0	±0.5
4	135.4	135.4	0.0	±0.5
5	135.4	135.4	0.0	±0.5
6	135.4	135.4	0.0	±0.5
7	135.4	135.4	0.0	±0.5
8	135.4	135.4	0.0	±0.5
9	135.4	135.4	0.0	±0.5
10	135.4	135.4	0.0	±0.5
11	135.4	135.4	0.0	±0.5
12	135.4	135.4	0.0	±0.5
13	135.4	135.4	0.0	±0.5
14	135.4	135.4	0.0	±0.5
15	135.4	135.4	0.0	±0.5
16	135.4	135.4	0.0	±0.5
17	135.4	135.4	0.0	±0.5
18	135.4	135.4	0.0	±0.5
19	135.4	135.4	0.0	±0.5
20	135.4	135.4	0.0	±0.5

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T. R. R. R.

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7. Level linearity on the reference level range

Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
120.0	120.0	0.0	±0.5
131.0	131.0	0.0	±0.5
142.0	142.0	0.0	±0.5
153.0	153.0	0.0	±0.5
164.0	164.0	0.0	±0.5
175.0	175.0	0.0	±0.5
186.0	186.0	0.0	±0.5
197.0	197.0	0.0	±0.5
208.0	208.0	0.0	±0.5
219.0	219.0	0.0	±0.5
230.0	230.0	0.0	±0.5
241.0	241.0	0.0	±0.5
252.0	252.0	0.0	±0.5
263.0	263.0	0.0	±0.5
274.0	274.0	0.0	±0.5
285.0	285.0	0.0	±0.5
296.0	296.0	0.0	±0.5
307.0	307.0	0.0	±0.5
318.0	318.0	0.0	±0.5
329.0	329.0	0.0	±0.5
340.0	340.0	0.0	±0.5
351.0	351.0	0.0	±0.5
362.0	362.0	0.0	±0.5
373.0	373.0	0.0	±0.5
384.0	384.0	0.0	±0.5
395.0	395.0	0.0	±0.5
406.0	406.0	0.0	±0.5
417.0	417.0	0.0	±0.5
428.0	428.0	0.0	±0.5
439.0	439.0	0.0	±0.5
450.0	450.0	0.0	±0.5
461.0	461.0	0.0	±0.5
472.0	472.0	0.0	±0.5
483.0	483.0	0.0	±0.5
494.0	494.0	0.0	±0.5
505.0	505.0	0.0	±0.5
516.0	516.0	0.0	±0.5
527.0	527.0	0.0	±0.5
538.0	538.0	0.0	±0.5
549.0	549.0	0.0	±0.5
560.0	560.0	0.0	±0.5
571.0	571.0	0.0	±0.5
582.0	582.0	0.0	±0.5
593.0	593.0	0.0	±0.5
604.0	604.0	0.0	±0.5
615.0	615.0	0.0	±0.5
626.0	626.0	0.0	±0.5
637.0	637.0	0.0	±0.5
648.0	648.0	0.0	±0.5
659.0	659.0	0.0	±0.5
670.0	670.0	0.0	±0.5
681.0	681.0	0.0	±0.5
692.0	692.0	0.0	±0.5
703.0	703.0	0.0	±0.5
714.0	714.0	0.0	±0.5
725.0	725.0	0.0	±0.5
736.0	736.0	0.0	±0.5
747.0	747.0	0.0	±0.5
758.0	758.0	0.0	±0.5
769.0	769.0	0.0	±0.5
780.0	780.0	0.0	±0.5
791.0	791.0	0.0	±0.5
802.0	802.0	0.0	±0.5
813.0	813.0	0.0	±0.5
824.0	824.0	0.0	±0.5
835.0	835.0	0.0	±0.5
846.0	846.0	0.0	±0.5
857.0	857.0	0.0	±0.5
868.0	868.0	0.0	±0.5
879.0	879.0	0.0	±0.5
890.0	890.0	0.0	±0.5
901.0	901.0	0.0	±0.5
912.0	912.0	0.0	±0.5
923.0	923.0	0.0	±0.5
934.0	934.0	0.0	±0.5
945.0	945.0	0.0	±0.5
956.0	956.0	0.0	±0.5
967.0	967.0	0.0	±0.5
978.0	978.0	0.0	±0.5
989.0	989.0	0.0	±0.5
1000.0	1000.0	0.0	±0.5

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11. Deviation indication

Assigned Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
120.0	120.0	0.0	±0.5
131.0	131.0	0.0	±0.5
142.0	142.0	0.0	±0.5
153.0	153.0	0.0	±0.5
164.0	164.0	0.0	±0.5
175.0	175.0	0.0	±0.5
186.0	186.0	0.0	±0.5
197.0	197.0	0.0	±0.5
208.0	208.0	0.0	±0.5
219.0	219.0	0.0	±0.5
230.0	230.0	0.0	±0.5
241.0	241.0	0.0	±0.5
252.0	252.0	0.0	±0.5
263.0	263.0	0.0	±0.5
274.0	274.0	0.0	±0.5
285.0	285.0	0.0	±0.5
296.0	296.0	0.0	±0.5
307.0	307.0	0.0	±0.5
318.0	318.0	0.0	±0.5
329.0	329.0	0.0	±0.5
340.0	340.0	0.0	±0.5
351.0	351.0	0.0	±0.5
362.0	362.0	0.0	±0.5
373.0	373.0	0.0	±0.5
384.0	384.0	0.0	±0.5
395.0	395.0	0.0	±0.5
406.0	406.0	0.0	±0.5
417.0	417.0	0.0	±0.5
428.0	428.0	0.0	±0.5
439.0	439.0	0.0	±0.5
450.0	450.0	0.0	±0.5
461.0	461.0	0.0	±0.5
472.0	472.0	0.0	±0.5
483.0	483.0	0.0	±0.5
494.0	494.0	0.0	±0.5
505.0	505.0	0.0	±0.5
516.0	516.0	0.0	±0.5
527.0	527.0	0.0	±0.5
538.0	538.0	0.0	±0.5
549.0	549.0	0.0	±0.5
560.0	560.0	0.0	±0.5
571.0	571.0	0.0	±0.5
582.0	582.0	0.0	±0.5
593.0	593.0	0.0	±0.5
604.0	604.0	0.0	±0.5
615.0	615.0	0.0	±0.5
626.0	626.0	0.0	±0.5
637.0	637.0	0.0	±0.5
648.0	648.0	0.0	±0.5
659.0	659.0	0.0	±0.5
670.0	670.0	0.0	±0.5
681.0	681.0	0.0	±0.5
692.0	692.0	0.0	±0.5
703.0	703.0	0.0	±0.5
714.0	714.0	0.0	±0.5
725.0	725.0	0.0	±0.5
736.0	736.0	0.0	±0.5
747.0	747.0	0.0	±0.5
758.0	758.0	0.0	±0.5
769.0	769.0	0.0	±0.5
780.0	780.0	0.0	±0.5
791.0	791.0	0.0	±0.5
802.0	802.0	0.0	±0.5
813.0	813.0	0.0	±0.5
824.0	824.0	0.0	±0.5
835.0	835.0	0.0	±0.5
846.0	846.0	0.0	±0.5
857.0	857.0	0.0	±0.5</

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Continuation of Calibration Certificate

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8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
100	94.0	94.0	0.0	±0.5

9. Time burst response

Time	Time burst duration, 10	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Weighting	1	110.0	110.0	0.0	±0.5
Fast	2	117.0	117.0	0.0	±0.5
Slow	2	117.0	117.0	0.0	±0.5
SEL	2	117.0	117.0	0.0	±0.5

10. Peak C-weight level

Number of cycle	In	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
1	130.0	130.0	130.0	0.0	±0.5
2	130.0	130.0	130.0	0.0	±0.5
3	130.0	130.0	130.0	0.0	±0.5
4	130.0	130.0	130.0	0.0	±0.5
5	130.0	130.0	130.0	0.0	±0.5
6	130.0	130.0	130.0	0.0	±0.5
7	130.0	130.0	130.0	0.0	±0.5
8	130.0	130.0	130.0	0.0	±0.5
9	130.0	130.0	130.0	0.0	±0.5
10	130.0	130.0	130.0	0.0	±0.5
11	130.0	130.0	130.0	0.0	±0.5
12	130.0	130.0	130.0	0.0	±0.5
13	130.0	130.0	130.0	0.0	±0.5
14	130.0	130.0	130.0	0.0	±0.5
15	130.0	130.0	130.0	0.0	±0.5
16	130.0	130.0	130.0	0.0	±0.5
17	130.0	130.0	130.0	0.0	±0.5
18	130.0	130.0	130.0	0.0	±0.5
19	130.0	130.0	130.0	0.0	±0.5
20	130.0	130.0	130.0	0.0	±0.5

QP-TN12-04-0010-0010

7. 100%

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11. Level linearity on the reference level range

Range	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
100	94.0	94.0	0.0	±0.5
110	104.0	104.0	0.0	±0.5
120	114.0	114.0	0.0	±0.5
130	124.0	124.0	0.0	±0.5
140	134.0	134.0	0.0	±0.5
150	144.0	144.0	0.0	±0.5
160	154.0	154.0	0.0	±0.5
170	164.0	164.0	0.0	±0.5
180	174.0	174.0	0.0	±0.5
190	184.0	184.0	0.0	±0.5
200	194.0	194.0	0.0	±0.5
210	204.0	204.0	0.0	±0.5
220	214.0	214.0	0.0	±0.5
230	224.0	224.0	0.0	±0.5
240	234.0	234.0	0.0	±0.5
250	244.0	244.0	0.0	±0.5
260	254.0	254.0	0.0	±0.5
270	264.0	264.0	0.0	±0.5
280	274.0	274.0	0.0	±0.5
290	284.0	284.0	0.0	±0.5
300	294.0	294.0	0.0	±0.5
310	304.0	304.0	0.0	±0.5
320	314.0	314.0	0.0	±0.5
330	324.0	324.0	0.0	±0.5
340	334.0	334.0	0.0	±0.5
350	344.0	344.0	0.0	±0.5
360	354.0	354.0	0.0	±0.5
370	364.0	364.0	0.0	±0.5
380	374.0	374.0	0.0	±0.5
390	384.0	384.0	0.0	±0.5
400	394.0	394.0	0.0	±0.5
410	404.0	404.0	0.0	±0.5
420	414.0	414.0	0.0	±0.5
430	424.0	424.0	0.0	±0.5
440	434.0	434.0	0.0	±0.5
450	444.0	444.0	0.0	±0.5
460	454.0	454.0	0.0	±0.5
470	464.0	464.0	0.0	±0.5
480	474.0	474.0	0.0	±0.5
490	484.0	484.0	0.0	±0.5
500	494.0	494.0	0.0	±0.5
510	504.0	504.0	0.0	±0.5
520	514.0	514.0	0.0	±0.5
530	524.0	524.0	0.0	±0.5
540	534.0	534.0	0.0	±0.5
550	544.0	544.0	0.0	±0.5
560	554.0	554.0	0.0	±0.5
570	564.0	564.0	0.0	±0.5
580	574.0	574.0	0.0	±0.5
590	584.0	584.0	0.0	±0.5
600	594.0	594.0	0.0	±0.5
610	604.0	604.0	0.0	±0.5
620	614.0	614.0	0.0	±0.5
630	624.0	624.0	0.0	±0.5
640	634.0	634.0	0.0	±0.5
650	644.0	644.0	0.0	±0.5
660	654.0	654.0	0.0	±0.5
670	664.0	664.0	0.0	±0.5
680	674.0	674.0	0.0	±0.5
690	684.0	684.0	0.0	±0.5
700	694.0	694.0	0.0	±0.5
710	704.0	704.0	0.0	±0.5
720	714.0	714.0	0.0	±0.5
730	724.0	724.0	0.0	±0.5
740	734.0	734.0	0.0	±0.5
750	744.0	744.0	0.0	±0.5
760	754.0	754.0	0.0	±0.5
770	764.0	764.0	0.0	±0.5
780	774.0	774.0	0.0	±0.5
790	784.0	784.0	0.0	±0.5
800	794.0	794.0	0.0	±0.5
810	804.0	804.0	0.0	±0.5
820	814.0	814.0	0.0	±0.5
830	824.0	824.0	0.0	±0.5
840	834.0	834.0	0.0	±0.5
850	844.0	844.0	0.0	±0.5
860	854.0	854.0	0.0	±0.5
870	864.0	864.0	0.0	±0.5
880	874.0	874.0	0.0	±0.5
890	884.0	884.0	0.0	±0.5
900	894.0	894.0	0.0	±0.5
910	904.0	904.0	0.0	±0.5
920	914.0	914.0	0.0	±0.5
930	924.0	924.0	0.0	±0.5
940	934.0	934.0	0.0	±0.5
950	944.0	944.0	0.0	±0.5
960	954.0	954.0	0.0	±0.5
970	964.0	964.0	0.0	±0.5
980	974.0	974.0	0.0	±0.5
990	984.0	984.0	0.0	±0.5
1000	994.0	994.0	0.0	±0.5

QP-TN12-04-0010-0010

7. 100%

SITHIPORN SITHIPORN ASSOCIATES CO. LTD.
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No.: ALC12009
Lab No.: 11644-0010
Page: 1 of 4

11. Level linearity on the reference level range

Range	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
100	94.0	94.0	0.0	±0.5
110	104.0	104.0	0.0	±0.5
120	114.0	114.0	0.0	±0.5
130	124.0	124.0	0.0	±0.5
140	134.0	134.0	0.0	±0.5
150	144.0	144.0	0.0	±0.5
160	154.0	154.0	0.0	±0.5
170	164.0	164.0	0.0	±0.5
180	174.0	174.0	0.0	±0.5
190	184.0	184.0	0.0	±0.5
200	194.0	194.0	0.0	±0.5
210	204.0	204.0	0.0	±0.5
220	214.0	214.0	0.0	±0.5
230	224.0	224.0	0.0	±0.5
240	234.0	234.0	0.0	±0.5
250	244.0	244.0	0.0	±0.5
260	254.0	254.0	0.0	±0.5
270	264.0	264.0	0.0	±0.5
280	274.0	274.0	0.0	±0.5
290	284.0	284.0	0.0	±0.5
300	294.0	294.0	0.0	±0.5
310	304.0	304.0	0.0	±0.5
320	314.0	314.0	0.0	±0.5
330	324.0	324.0	0.0	±0.5
340	334.0	334.0	0.0	±0.5
350	344.0	344.0	0.0	±0.5
360	354.0	354.0	0.0	±0.5
370	364.0	364.0	0.0	±0.5
380	374.0	374.0	0.0	±0.5
390	384.0	384.0	0.0	±0.5
400	394.0	394.0	0.0	±0.5
410	404.0	404.0	0.0	±0.5
420	414.0	414.0	0.0	±0.5
430	424.0	424.0	0.0	±0.5
440	434.0	434.0	0.0	±0.5
450	444.0	444.0	0.0	±0.5
460	454.0	454.0	0.0	±0.5
470	464.0	464.0	0.0	±0.5
480	474.0	474.0	0.0	±0.5
490	484.0	484.0	0.0	±0.5
500	494.0	494.0	0.0	±0.5
510	504.0	504.0	0.0	±0.5
520	514.0	514.0	0.0	±0.5
530	524.0	524.0	0.0	±0.5
540	534.0	534.0	0.0	±0.5
550	544.0	544.0	0.0	±0.5
560	554.0	554.0	0.0	±0.5
570	564.0	564.0	0.0	±0.5
580	574.0	574.0	0.0	±0.5
590	584.0	584.0	0.0	±0.5
600	594.0	594.0	0.0	±0.5
610	604.0	604.0	0.0	±0.5
620	614.0	614.0	0.0	±0.5
630	624.0	624.0	0.0	±0.5
640	634.0	634.0	0.0	±0.5
650	644.0	644.0	0.0	±0.5
660	654.0	654.0	0.0	±0.5
670	664.0	664.0	0.0	±0.5
680	674.0	674.0	0.0	±0.5
690	684.0	684.0	0.0	±0.5
700	694.0	694.0	0.0	±0.5
710	704.0	704.0	0.0	±0.5
720	714.0	714.0	0.0	±0.5
730	724.0	724.0	0.0	±0.5
740	734.0	734.0	0.0	±0.5
750	744.0	744.0	0.0	±0.5
760	754.0	754.0	0.0	±0.5
770	764.0	764.0	0.0	±0.5
780	774.0	774.0	0.0	±0.5
790	784.0	784.0	0.0	±0.5
800	794.0	794.0	0.0	±0.5
810	804.0	804.0	0.0	±0.5
820	814.0	814.0	0.0	±0.5
830	824.0	824.0	0.0	±0.5
840	834.0	834.0	0.0	±0.5
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860	854.0	854.0	0.0	±0.5
870	864.0	864.0	0.0	±0.5
880	874.0	874.0	0.0	±0.5
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950	944.0	944.0	0.0	±0.5
960	954.0	954.0	0.0	±0.5
970	964.0	964.0	0.0	±0.5
980	974.0	974.0	0.0	±0.5
990	984.0	984.0	0.0	±0.5
1000	994.0	994.0	0.0	±0.5

QP-TN12-04-0010-0010

7. 100%

SITHIPORN SITHIPORN ASSOCIATES CO. LTD.
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Sartorius (Thailand) Co., Ltd.
Certificate of Calibration
Model Number: MBB120H-100 DU
Serial Number: 502109004
Reference No.: 20230114
Calibration Date: 2023-01-14
Page No.: 3 of 3

Calibration Results : Without Adjustment

Parameter	Unit	Value	Uncertainty
Normal Value (Low Load)	g	10.0000	0.0005
Normal Value (High Load)	g	100.0000	0.0010
Normal Value (High Load)	g	1000.0000	0.0015
Normal Value (High Load)	g	10000.0000	0.0020

End of Report

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND) P.V.
Certificate of Calibration
Model Number: 10000000000000000000
Serial Number: 10000000000000000000
Reference No.: 10000000000000000000
Calibration Date: 10000000000000000000
Page No.: 1 of 2

Certificate of Calibration

Calibration Results : Without Adjustment

End of Report

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND) P.V.
Certificate of Calibration
Model Number: 10000000000000000000
Serial Number: 10000000000000000000
Reference No.: 10000000000000000000
Calibration Date: 10000000000000000000
Page No.: 1 of 2

Certificate of Calibration

Calibration Results : Without Adjustment

End of Report

Sartorius (Thailand) Co., Ltd.
Certificate of Calibration
Model Number: MBB120H-100 DU
Serial Number: 502109004
Reference No.: 20230114
Calibration Date: 2023-01-14
Page No.: 3 of 3

Calibration Results : Without Adjustment

Parameter	Unit	Value	Uncertainty
Normal Value (Low Load)	g	10.0000	0.0005
Normal Value (High Load)	g	100.0000	0.0010
Normal Value (High Load)	g	1000.0000	0.0015
Normal Value (High Load)	g	10000.0000	0.0020

End of Report

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND) P.V.
Certificate of Calibration
Model Number: 10000000000000000000
Serial Number: 10000000000000000000
Reference No.: 10000000000000000000
Calibration Date: 10000000000000000000
Page No.: 1 of 2

Certificate of Calibration

Calibration Results : Without Adjustment

End of Report

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND) P.V.
Certificate of Calibration
Model Number: 10000000000000000000
Serial Number: 10000000000000000000
Reference No.: 10000000000000000000
Calibration Date: 10000000000000000000
Page No.: 1 of 2

Certificate of Calibration

Calibration Results : Without Adjustment

End of Report

