



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Athamas Sale & Service Co., Ltd
254/152 Ramkhamhaeng 112 Rd.
Sapansoong, Bangkok, 10240, Thailand

Fulfills the requirements of

ISO/IEC 17025:2017

In the field of

CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

Jason Stine, Vice President

Expiry Date: 11 July 2027

Certificate Number: AC-3401



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory
quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Athamas Sale & Service Co., Ltd

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CALIBRATION

ISO/IEC 17025 Accreditation Granted: **11 July 2025**

Certificate Number: **AC-3401** Certificate Expiry Date: **11 July 2027**

Chemical Quantities

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
pH Meter ¹	pH 4 pH 7 pH 10	0.021 pH 0.021 pH 0.021 pH	Comparison to pH Buffer Solutions
Conductivity Meter ¹	84 µS/cm 1 413 µS/cm 12 880 µS/cm	0.84 µS/cm 7.1 µS/cm 0.07 mS/cm	Comparison to Conductivity Buffer Solutions
Refractometer ¹	5 %Brix 10 %Brix 20 %Brix 30 %Brix 40 %Brix 50 %Brix 60 %Brix	0.025 0.025 0.052 0.061 0.071 0.091 0.091	Comparison to Sucrose Standard Solutions

Chemical Quantities

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Refractometer (Refractive Index) ¹	1.342 07	0.000 18	Comparison to Sucrose Standard Solutions
	1.347 82	0.000 18	
	1.363 84	0.000 18	
	1.381 14	0.000 18	
	1.399 84	0.000 18	
	1.420 07	0.000 19	
	1.441 88	0.000 19	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Voltage - Source ¹	(-10 to 100) mV	0.08 mV	Comparison to Multifunction Process Calibrator Fluke 701
	(> 0.1 to 1) V	0.013 V	
	(> 1 to 10) V	0.009 V	
DC Current - Source ¹	(2 to 22) mA	0.015 mA	Comparison to Multifunction Process Calibrator Fluke 701
Resistance - Source ¹	Up to 10 Ω	0.064 Ω	Comparison to Multifunction Process Calibrator Fluke 701
	(> 10 to 100) Ω	0.12 Ω	
	(> 0.1 to 1) k Ω	0.008 k Ω	
	(> 1 to 5) k Ω	0.017 k Ω	
	(> 5 to 10) k Ω	0.024 k Ω	
DC Voltage - Measure ¹	Up to 10 mV	0.028 mV	Comparison to Multifunction Process Calibrator Fluke 701
	(> 10 to 50) mV	0.05 mV	
	(> 50 to 100) mV	0.078 mV	
	(> -1 to 1) V	0.012 V	
	(> 1 to 10) V	0.017 V	
	(> 10 to 30) V	0.038 V	

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Current – Measure ¹	(-30 to 0) mA (> 0 to 4) mA (> 4 to 20) mA (> 20 to 30) mA	0.019 mA 0.012 mA 0.017 mA 0.019 mA	Comparison to Multifunction Process Calibrator Fluke 701
Resistance – Measure ¹	Up to 10 Ω (> 10 to 50) Ω (> 50 to 100) Ω (> 100 to 500) Ω (> 500 to 1 000) Ω (> 1 to 4) k Ω	0.07 Ω 0.12 Ω 0.17 Ω 1.2 Ω 1.7 Ω 0.6 k Ω	Comparison to Multifunction Process Calibrator Fluke 701
Electrical Simulation of RTD Indicating Devices – Source/Measure PT385 (100 Ω) ¹	PT385 (100 Ω) (-200 to 0) °C (> 0 to 300) °C (> 300 to 800) °C	0.8 °C 1 °C 1.4 °C	Comparison to Multifunction Process Calibrator Fluke 701

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Electrical Simulation of Thermocouple Indicating Devices – Source/Measure ¹	Type K		Comparison to Multifunction Process Calibrator Fluke 701
	(-200 to 0) °C	1.1 °C	
	(> 0 to 300) °C	0.6 °C	
	(> 300 to 500) °C	0.8 °C	
	(> 500 to 1 300) °C	1.1 °C	
	Type T		
	(-200 to 0) °C	1.0 °C	
	(> 0 to 200) °C	0.9 °C	
	(> 200 to 400) °C	0.6 °C	
	Type J		
	(-200 to 0) °C	0.9 °C	
	(> 0 to 300) °C	0.6 °C	
	(> 300 to 1 200) °C	0.8 °C	
	Type E		
	(-200 to 0) °C	1.7 °C	
	(> 0 to 500) °C	0.6 °C	
	(> 500 to 1 000) °C	0.7 °C	
	Type R		
	(0 to 300) °C	2.9 °C	
	(> 300 to 1 700) °C	1.5 °C	
	Type S		
	(0 to 300) °C	2.9 °C	
	(> 300 to 800) °C	1.3 °C	
	(> 800 to 1 700) °C	1.5 °C	

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Mass Determination	1 kg 2 kg 5 kg 10 kg 20 kg	8.2 mg 16 mg 36 mg 0.3 g 0.32 g	Comparison to Weights Set / Electronic Balance
Scales and Balances ¹			
Resolution 0.0001 g	50 mg to 50 g (50 to 100) g (100 to 200) g (200 to 300) g	0.4 mg 0.7 mg 1.4 mg 2.1 mg	Comparison to Weights Set
Resolution 0.001 g	(> 300 to 500) g (> 500 to 1 000) g (> 1 to 1.5) kg (> 1.5 to 2) kg (> 2 to 3) kg (> 3 to 5) kg (> 5 to 10) kg (> 10 to 15) kg (> 15 to 20) kg	4 mg 7 mg 10 mg 14 mg 21 mg 34 mg 69 mg 0.1 g 0.14 g	
Scales and Balances ¹			
Resolution 0.01 kg	(> 20 to 30) kg (> 30 to 100) kg (>100 to 150) kg (> 100 to 200) kg (> 200 to 300) kg (> 300 to 500) kg (> 500 to 750) kg (> 750 to 1 000) kg	10 g 12 g 13 g 15 g 20 g 30 g 45 g 59 g	Comparison to Weights Set

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Gauge Pressure – Analog and Digital Pressure Gauges, Pressure Transducers, Pressure Transmitters, Differential Pressure Gauges, Manometers, Pressure Switches (Pneumatic & Hydraulic) ¹	(0 to 2 000) kPa (0 to 140) bar (> 140 to 700) bar	0.75 kPa 0.17 bar 0.81 bar	Comparison to Digital Pressure Indicator PC6-PRO-0020 and Digital Test Gauge XP2i
Vacuum Gauge ¹	(-90 to 0) kPa	0.04 kPa	Comparison to Digital Pressure Indicator PC6-PRO-0020

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Air Temperature Controlled, Chamber, Hot Air Oven ¹	(25 to 50) °C (>50 to 100) °C (>100 to 150) °C (>150 to 200) °C (>200 to 250) °C	0.4 °C 0.51 °C 0.62 °C 0.73 °C 0.85 °C	Comparison to Data Acquisition/Switch Unit w/Sensor
Incubator ¹	(10 to 50) °C (>50 to 100) °C (>100 to 150) °C	0.4 °C 0.51 °C 0.62 °C	Comparison to Data Acquisition/Switch Unit w/Sensor
Refrigerator & Freezer ¹	(-40 to -20) °C (>-20 to 0) °C (>0 to 10) °C	0.38 °C 0.31 °C 0.4 °C	Comparison to Data Acquisition/Switch Unit w/Sensor
Autoclave ¹	(100 to 110) °C (>110 to 135) °C	0.54 °C 0.63 °C	Comparison to Data Acquisition/Switch Unit w/Sensor

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Liquid Bath, Water Bath ¹	(-40 to -20) °C (-20 to 0) °C (0 to 10) °C (10 to 50) °C (50 to 100) °C (100 to 150) °C	0.38 °C 0.31 °C 0.4 °C 0.42 °C 0.52 °C 0.62 °C	Comparison to Data Acquisition/Switch Unit w/ RTD Sensor
Dial Thermometer ¹	(-40 to 200) °C (200 to 400) °C (400 to 450) °C (450 to 650) °C	0.046 °C 0.053 °C 2 °C 2.5 °C	Comparison to Temperature Indicator with PRT Standard DTI1000, Fluke 741 with thermocouple Type S
Thermocouple Probe Types K, J, E, T, N, R, S ¹	(-40 to 200) °C (200 to 400) °C (400 to 450) °C (450 to 1100) °C	0.089 °C 0.093 °C 2 °C 2.5 °C	Comparison to Temperature Indicator with PRT Standard DTI1000, Fluke 741 with thermocouple Type S
Thermocouple Probe Types RTD ¹	(-40 to 200) °C (200 to 400) °C	0.089 °C 0.093 °C	Comparison to Temperature Indicator with PRT Standard DTI1000
Digital Thermometer With Sensor Types K, J, E, T, N, R, S ¹	(-40 to 200) °C (200 to 400) °C (400 to 450) °C (450 to 1100) °C	0.046 °C 0.053 °C 2 °C 2.5 °C	Comparison to Temperature Indicator with PRT Standard DTI1000, Fluke 741 with Thermocouple Type S
Digital Thermometer With Probe Type RTD ¹	(-40 to 200) °C (200 to 400) °C	0.046 °C 0.053 °C	Comparison to Temperature Indicator with PRT Standard DTI1000
Liquid-in-Glass Thermometers ¹	(-20 to 150) °C	0.07 °C	Comparison to Temperature Indicator with PRT Standard DTI1000

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature Thermo-hygrometer/ Thermo-hygrograph,	(5 to 50) °C (> 50 to 55) °C	0.49 °C 0.51 °C	Comparison to Standard Temperature/Humidity Meter
Relative Humidity Temperature/Humidity Meter	(25 to 90) %RH	2.4 %RH	
Infrared Thermometer ¹	(-40 to 0) °C (> 0 to 50) °C (> 50 to 100) °C (> 100 to 200) °C (> 200 to 250) °C (> 250 to 400) °C	0.8 °C 1.0 °C 1.2 °C 1.3 °C 2.2 °C 2.4 °C	Comparison to Reference IR Thermometer with Blackbody Source (Cavity), RTD with Temperature Indicator $\lambda = (8 \text{ to } 14) \mu\text{m}$, $\varepsilon = 0.95$

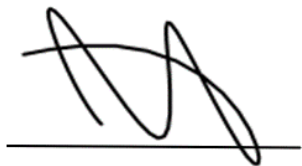
Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Stopwatch/Timer ¹	(1 to 1 800) s (1 800 to 3 600) s (3 600 to 5 400) s (5 400 to 7 200) s	0.082 s 0.084 s 0.088 s 0.093 s	Comparison to Reference Stopwatch

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ($k=2$), corresponding to a confidence level of approximately 95%.

Notes:

- On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.



Jason Stine, Vice President