SINGAPORE LABORATORY ACCREDITATION SCHEME

Accredited Laboratory SAC-SINGLAS

Schedule

Supertron Sensing Pte Ltd
Blk 16 Kallang Place
#07-04
Singapore 339156

Certificate No. : LA-2011-0485-C

Issue No. : 11

Date : 30 March 2023

Expiry of Certificate : 10 May 2026

FIELD OF TESTING : Calibration and Measurement

MEASURED QUANTITIES/ INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD OF CALIBRATION	CALIBRATION AND MEASUREMENT CAPABILITY (CMC *)
1. Pressure Measuring Devices i. Calibrator ii. Transducer/ Transmitter iii. Digital Indicator	In-house Procedure CP-H, Rev 10	
Range of Measurement		
a. (10 to 50) psi abs		0.025 psi abs
b. (50 to 300) psi abs		0.06 psi abs
2. Humidity Measurement	In-house Procedure CP-N, Rev 4	
i. Dew/ Frost Point	CP-M, Rev 4	
Range of Measurement		
a. -90 °C to -85 °C Frost Point		0.60 °C
b. -85 °C to -75 °C Frost Point		0.35 °C
c. -75 °C to -60 °C Frost Point		0.20 °C
d. -60 °C to -30 °C Frost Point		0.13 °C
e. -30 °C to +70 °C Frost/ Dew Point		0.10 °C

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MEASURED QUANTITIES/ INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD OF CALIBRATION	CALIBRATION AND MEASUREMENT CAPABILITY (CMC *)
ii. Relative Humidity (Chilled Mirror Hygrometer with air temperature probe)	In-house Procedure CP-N, Rev 4	Corresponding to above dew-point and temperature uncertainties
iii. Relative Humidity Sensor/ Instrument		
iv. Thermo-hygrometer		
<u>Range of Measurement</u>		
a. At -10 °C to 0°C		
(10 to 30) % relative humidity		(0.2 to 0.4) % relative humidity
(30 to 50) % relative humidity		(0.4 to 0.6) % relative humidity
(50 to 70) % relative humidity		(0.6 to 0.8) % relative humidity
(70 to 95) % relative humidity		(0.8 to 1.0) % relative humidity
b. At 0 °C to 23°C		
(10 to 30) % relative humidity		(0.2 to 0.3) % relative humidity
(30 to 50) % relative humidity		(0.3 to 0.4) % relative humidity
(50 to 70) % relative humidity		(0.4 to 0.6) % relative humidity
(70 to 98) % relative humidity		(0.6 to 0.8) % relative humidity
c. At 23 °C to 50°C		
(10 to 30) % relative humidity		(0.2 to 0.3) % relative humidity
(30 to 50) % relative humidity		(0.3 to 0.4) % relative humidity
(50 to 70) % relative humidity		(0.4 to 0.5) % relative humidity
(70 to 98) % relative humidity		(0.5 to 0.6) % relative humidity
d. At 50 °C to 70°C		
(10 to 30) % relative humidity		(0.2 to 0.3) % relative humidity
(30 to 50) % relative humidity		(0.3 to 0.4) % relative humidity
(50 to 70) % relative humidity		(0.4 to 0.5) % relative humidity
(70 to 98) % relative humidity		(0.4 to 0.5) % relative humidity

MEASURED QUANTITIES/ INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD OF CALIBRATION	CALIBRATION AND MEASUREMENT CAPABILITY (CMC *)
3. Temperature		
A. Liquid bath method		
i. Temperature indicator and Recorders, with temperature sensor(s)	In-house Procedure CP-C, Rev 3	
ii. Industrial Platinum Resistance Thermometer		
iii. Thermistor		
<u>Range of Measurement</u>		
a. -196 °C		20 mK
b. (-90 to +5) °C		20 mK
c. (+5 to +250) °C		20 mK
d. Ice Point, 0 °C		10 mK
e. (0 to +30) °C	} Either by Fixed Point or by	10 mK
f. Water Triple Point	} comparison with SPRT In	10 mK
g. Gallium Fixed Point	} liquid bath	10 mK

MEASURED QUANTITIES / INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD OF CALIBRATION	CALIBRATION AND MEASUREMENT CAPABILITY (CMC *)
B. Air chamber method		
i. Temperature sensors incorporated in humidity instruments	In-house Procedure CP-N, Rev 4	
Range of Measurement		
a. (-10 to 70) °C		0.09°C
ii. Thermistor		
iii. Chilled Mirror Hygrometer with air temperature probe		
iv. Temperature indicator with temperature sensor		
Range of Measurement		
a. (-10 to 0) °C		0.08 °C
b. (0 to 23) °C		0.07 °C
c. (23 to 70) °C		0.08 °C
4. On-Site Humidity Measurement		
i. Temperature & Humidity Generator (-10 to 70) °C	In-house / Site Procedure CP-N, Rev 4	0.08 °C
Range of Measurement	Comparison with a chilled mirror hygrometer with a temperature probe	
a. At -10 °C to 0°C		
(10 to 30) % relative humidity		(0.2 to 0.4)% relative humidity
(30 to 50) % relative humidity		(0.4 to 0.6)% relative humidity
(50 to 70) % relative humidity		(0.6 to 0.8)% relative humidity
(70 to 95) % relative humidity		(0.8 to 1.0)% relative humidity

MEASURED QUANTITIES / INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD OF CALIBRATION	CALIBRATION AND MEASUREMENT CAPABILITY (CMC *)
b. At 0 °C to 23°C		
(10 to 30) % relative humidity		(0.2 to 0.3)% relative humidity
(30 to 50) % relative humidity		(0.3 to 0.4)% relative humidity
(50 to 70) % relative humidity		(0.4 to 0.6)% relative humidity
(70 to 98) % relative humidity		(0.6 to 0.8)% relative humidity
c. At 23 °C to 50°C		
(10 to 30) % relative humidity		(0.2 to 0.3)% relative humidity
(30 to 50) % relative humidity		(0.3 to 0.4)% relative humidity
(50 to 70) % relative humidity		(0.4 to 0.5)% relative humidity
(70 to 98) % relative humidity		(0.5 to 0.6)% relative humidity
d. At 50 °C to 70°C		
(10 to 30) % relative humidity		(0.2 to 0.3)% relative humidity
(30 to 50) % relative humidity		(0.3 to 0.4)% relative humidity
(50 to 70) % relative humidity		(0.4 to 0.5)% relative humidity
(70 to 98) % relative humidity		(0.4 to 0.5)% relative humidity
ii. Relative Humidity Sensor / Instrument	In-house / Site Procedure CP-N, Rev 4	
iii. Thermo-hygrometer		
iv. Hygrometers		
v. Temperature sensors incorporated in humidity instruments		
(0 to 25) °C		0.21 °C
(45 to 60) °C		0.23 °C

MEASURED QUANTITIES/ INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD OF CALIBRATION	CALIBRATION AND MEASUREMENT CAPABILITY (CMC *)
Range of Measurement a. At 0 °C to 25°C	Comparison with a chilled mirror hygrometer with air temperature probe	
(10 to 50) % relative humidity		(0.4 to 1.0)% relative humidity
(50 to 85) % relative humidity		(1.0 to 1.7)% relative humidity
b. At 25 °C to 45°C		
(10 to 50) % relative humidity		(0.3 to 0.7)% relative humidity
(50 to 95) % relative humidity		(0.7 to 1.3)% relative humidity
c. At 45 °C to 60°C		
(10 to 50) % relative humidity		(0.3 to 0.7)% relative humidity
(50 to 90) % relative humidity		(0.7 to 1.2)% relative humidity
5. On-Site Pressure Measurement i. Calibrator ii. Transducer / Transmitter iii. Digital Indicator	In-House / Site Procedure, CP-H, Rev 10	
Range of Measurement		
a. (10 to 50) psi abs		0.03 psi abs
b. (50 to 150) psi abs		0.10 psi abs
6. On-Site Temperature Measurement **A. Liquid bath method**	In-House / Site Procedure CP-C, Rev 3	
i. Temperature indicator and Recorders, with temperature sensor (s)		0.06 °C
ii. Industrial Platinum Resistance Thermometer		
iii. Thermistor		
Range of Measurement		
a. (-10 to +70) °C		

* CMC is expressed as an expanded uncertainty estimated at a level of confidence of approximately 95%.

Schedule

Approved signatories :

Mr Tee Yee Chee @Mr Zheng Yiqi) All items
Ms Eva Marie Barrera)

Mr Terh Hock Kiong - 1 (Pressure Measuring Devices) and
5 (On-Site Pressure Measurement) only.

Note :

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025. A laboratory's fulfilment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and **management system requirements** that are necessary for it to consistently deliver technically valid test results. The **management system requirements** in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001.