

Schedule

Supertron Sensing Pte Ltd
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Certificate No. : LA-2011-0485-C
Issue No. : 13
Date : 31 July 2025
Expiry of Certificate : 10 May 2026
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FIELD OF TESTING : Calibration and Measurement

MEASURED QUANTITIES/ INSTRUMENTS / RANGE TO BE CALIBRATED	METHOD OF CALIBRATION	CALIBRATION AND MEASUREMENT CAPABILITY (CMC *)
<p>1. Pressure Measuring Devices</p> <p>i. Calibrator ii. Transducer/ Transmitter iii. Digital Indicator</p> <p><u>Range of Measurement</u></p> <p>a. (5 to 23) psi abs b. (23 to 50) psi abs c. (50 to 150) psi abs d. (150 to 300) psi abs</p>	<p>In-house Procedure CP-H, Rev 11</p>	<p>0.005 psi abs 0.013 psi abs 0.025 psi abs 0.040 psi abs</p>
<p>2. Humidity Measurement</p> <p>i. Dew/ Frost Point</p> <p><u>Range of Measurement</u></p> <p>a. -95 °C to -90 °C Frost Point b. -90 °C to -85 °C Frost Point c. -85 °C to -75 °C Frost Point d. -75 °C to -60 °C Frost Point e. -60 °C to -30 °C Frost Point f. -30 °C to 0°C Frost/ Dew Point</p>	<p>In-house Procedure CP-N, Rev 6 CP-M, Rev 5</p>	<p>0.90 °C 0.60 °C 0.35 °C 0.20 °C 0.13 °C 0.05 °C</p>

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g. 0 °C to +70°C Frost/ Dew Point		0.07 °C
h. +70 °C to +95°C Frost/ Dew Point		0.09 °C
ii. Relative Humidity (Chilled Mirror Hygrometer with air temperature probe)	In-house Procedure CP-N, Rev 6	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 (5 to 98) % relative humidity	Comparison with 2- Pressure 2-Temperature Humidity generator <i>rh</i> = measured value	0.1% + 0.011. <i>rh</i>
b. At 0 °C to 25°C (2 to 98) % relative humidity		0.1% + 0.008. <i>rh</i>
c. At 25 °C to 50°C (1 to 98) % relative humidity		0.1% + 0.004. <i>rh</i>
d. At 50 °C to 70°C (1 to 98) % relative humidity		0.1% + 0.005. <i>rh</i>
e. At 70 °C to 95°C (1 to 98) % relative humidity		0.1% + 0.007. <i>rh</i>
<u>Range of Measurement</u>		
a. At -10 °C to 0°C (5 to 98) % relative humidity	Comparison with a chilled mirror hygrometer with a temperature probe <i>rh</i> = measured value	0.16% + 0.008. <i>rh</i>
b. At 0 °C to 25°C (2 to 98) % relative humidity		0.18% + 0.004. <i>rh</i>

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<p>c. At 25 °C to 70°C (1 to 98) % relative humidity</p> <p>d. At 70 °C to 95°C (1 to 98) % relative humidity</p>		<p>0.21% + 0.003. <i>rh</i></p> <p>0.12% + 0.005. <i>rh</i></p>
<p>3. Temperature</p> <p>A. Liquid bath method</p> <p>i. Temperature indicator and Recorders, with temperature sensor(s)</p> <p>ii. Industrial Platinum Resistance Thermometer</p> <p>iii. Thermistor</p> <p><u>Range of Measurement</u></p> <p>a. -196 °C</p> <p>b. (-100 to +5) °C</p> <p>c. (+5 to +250) °C</p> <p>d. Ice Point, 0 °C</p> <p>e. (0 to +30) °C</p> <p>f. Water Triple Point</p> <p>g. Gallium Fixed Point</p> <p>B. Air chamber method</p> <p>i. Temperature sensors incorporated in humidity instruments</p> <p>ii. Thermistor</p> <p>iii. Chilled Mirror Hygrometer with air temperature probe</p> <p>iv. Temperature indicator with temperature sensor</p>	<p>In-house Procedure CP-C, Rev 3</p> <p>} Either by Fixed Point or by } comparison with SPRT In } liquid bath</p> <p>In-house Procedure CP-N, Rev 6</p>	<p>20 mK</p> <p>20 mK</p> <p>20 mK</p> <p>10 mK</p> <p>10 mK</p> <p>10 mK</p> <p>10 mK</p>

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<p><u>Range of Measurement</u></p> <p>a. (-10 to 0) °C</p> <p>b. (0 to 50) °C</p> <p>c. (50 to 70) °C</p> <p>d. (70 to 95) °C</p>		<p>0.06 °C</p> <p>0.05 °C</p> <p>0.08 °C</p> <p>0.09 °C</p>
<p>4. Lab/ On-Site Humidity Measurement</p> <p>i. Relative humidity generator (-10 to 70) °C</p> <p><u>Range of Measurement</u></p> <p>a. At -10 °C to 0°C (10 to 95) % relative humidity</p> <p>b. At 0 °C to 23°C (10 to 98) % relative humidity</p> <p>c. At 23 °C to 50°C (10 to 98) % relative humidity</p> <p>d. At 50 °C to 70°C (10 to 98) % relative humidity</p> <p>ii. Relative Humidity Sensor / Instrument</p> <p>iii. Thermo-hygrometer</p> <p>iv. Hygrometers</p> <p>v. Temperature sensors incorporated in humidity instruments (0 to 25) °C (45 to 60) °C</p>	<p>In-house / Site Procedure CP-N, Rev 6</p> <p>Comparison with a chilled mirror hygrometer with a temperature probe <i>rh</i> = measured value</p> <p>In-house / Site Procedure CP-N, Rev 6</p>	<p>0.08 °C</p> <p>0.16% + 0.008*<i>rh</i></p> <p>0.18% + 0.004*<i>rh</i></p> <p>0.21% + 0.003*<i>rh</i></p> <p>0.15% + 0.003*<i>rh</i></p> <p>0.21 °C</p> <p>0.23 °C</p>

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<p><u>Range of Measurement</u></p> <p>a. At 0 °C to 25°C (10 to 85) % relative humidity</p> <p>b. At 25 °C to 45°C (10 to 95) % relative humidity</p> <p>c. At 45 °C to 60°C (10 to 90) % relative humidity</p>	<p>Comparison with a chilled mirror hygrometer with air temperature probe <i>rh</i> = measured value</p>	<p>0.25% + 0.017*<i>rh</i></p> <p>0.20% + 0.013*<i>rh</i></p> <p>0.18 % + 0.012*<i>rh</i></p>
<p>5. On-Site Pressure Measurement</p> <p>i. Calibrator</p> <p>ii. Transducer / Transmitter</p> <p>iii. Digital Indicator</p> <p><u>Range of Measurement</u></p> <p>a. (10 to 50) psi abs</p> <p>b. (50 to 150) psi abs</p>	<p>In-House / Site Procedure, CP-H, Rev 11</p>	<p>0.03 psi abs</p> <p>0.10 psi abs</p>
<p>6. On-Site Temperature Measurement</p> <p>A. Liquid bath method</p> <p>i. Temperature indicator and Recorders, with temperature sensor (s)</p> <p>ii. Industrial Platinum Resistance Thermometer</p> <p>iii. Thermistor</p> <p>Range of Measurement</p> <p>a. (-10 to +70) °C</p>	<p>In-House / Site Procedure CP-C, Rev 3</p>	<p>0.06 °C</p>
<p>7. Controlled Temperature & Humidity Enclosures (Lab/ On-Site)</p>		

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<u>(Air Temperature)</u>		
i. Climatic Chamber (Dry Mode)	In-house / Site Procedure CP-L, Rev 2 Comparison with thermometer	
a. At -90 °C to 0°C		0.40 °C
b. At 0 °C to 95°C		0.60 °C
c. At 95 °C to 180°C		2.20 °C
ii. Climatic Chamber (Dry Mode) (Over reduced volume)		
a. At -90 °C to 0°C		0.17 °C
b. At 5 °C to 95°C	0.09 °C	
c. At 95 °C to 180°C	0.40 °C	
<u>(Relative Humidity)</u>		
i. Climatic Chamber (Wet Mode)	Comparison with a chilled mirror hygrometer with air temperature probe $rh = \text{measured value}$	
a. At 5 °C to 95°C (1 to 98) % relative humidity		1.30 °C $0.23\% + 0.027*rh$
ii. Climatic Chamber (Wet Mode) (Over reduced volume)		
a. At 5 °C to 95°C (1 to 98) % relative humidity		0.09 °C $0.17\% + 0.013*rh$

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

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Approved signatories :

Mr Tee Yee Chee @Mr Zheng Yiqi - All items

Ms Eva Marie Barrera - All items

Mr Terh Hock Kiong - Item 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.