

# Schedule

ISOLAB (Singapore) Pte Ltd  
2, Joo Koon Circle  
@ Level 2  
Singapore 629031

Certificate No. : LA-2003-0278-C  
Issue No. : 23  
Date : 30 December 2021  
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Field of Testing: Calibration and Measurement

MEASURED QUANTITIES/ INSTRUMENTS/RANGE TO BE CALIBRATED	METHOD	CALIBRATION AND MEASUREMENT CAPABILITY (CMC*)
<b>A. Temperature Calibration</b>		
<b>A1. Resistance temperature Devices Indicators</b>  -200 °C to 200 °C 200 °C to 850 °C	STCP-001 (Rev. 4)	0.01 °C 0.01 °C
<b>A2. Resistance temperature Devices Simulators</b>  -200 °C to 850 °C	STCP-001 (Rev. 4)	0.01 °C
<b>A3. Thermocouple Simulators</b>  <b>Type E</b> -270 °C to -150 °C -150 °C to -100 °C -100 °C to 0 °C 0 °C to 200 °C 200 °C to 1000 °C  <b>Type J</b> -210 °C to -150 °C -150 °C to -100 °C -100 °C to 0 °C 0 °C to 1200 °C	STCP-002 (Rev. 5)	0.35 °C 0.3°C 0.25 °C 0.2 °C 0.16 °C  0.35 °C 0.25°C 0.2 °C 0.2 °C

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<b>Type K</b> -270 °C to -150 °C -150 °C to -100 °C -100 °C to 0 °C 0 °C to 900 °C 900 °C to 1372 °C		0.3 °C 0.25°C 0.2 °C 0.2 °C 0.25 °C
<b>Type N</b> -270 °C to -150 °C -150 °C to -100 °C -100 °C to 100 °C 100 °C to 200 °C 200 °C to 1300 °C		0.4 °C 0.3°C 0.25 °C 0.2 °C 0.22 °C
<b>Type R</b> -50 °C to 100 °C 100 °C to 400 °C 400 °C to 600 °C 600 °C to 900 °C 900 °C to 1768 °C		0.5 °C 0.4°C 0.4 °C 0.33 °C 0.3 °C
<b>Type S</b> -50 °C to 100 °C 100 °C to 200 °C 200 °C to 400 °C 400 °C to 700 °C 700 °C to 1768 °C		0.5 °C 0.4°C 0.4 °C 0.33 °C 0.3 °C
<b>Type T</b> -270 °C to -150 °C -150 °C to -100 °C -100 °C to 0 °C 0 °C to 200 °C 200 °C to 400 °C		0.3 °C 0.28°C 0.25 °C 0.2 °C 0.17 °C
<b>Type B</b> 200 °C to 600 °C 600 °C to 1700 °C		0.5 °C 0.3 °C

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<b>A4. Thermocouple Indicators</b>  <b>Type E</b> -200 °C to -150 °C -150 °C to -100 °C -100 °C to 0 °C 0 °C to 200 °C 200 °C to 1000 °C  <b>Type J</b> -210 °C to -150 °C -150 °C to -100 °C -100 °C to 100 °C 100 °C to 1200 °C  <b>Type K</b> -200 °C to -150 °C -150 °C to -100 °C -100 °C to 0 °C 0 °C to 1000 °C 1000 °C to 1372 °C  <b>Type N</b> -270 °C to -150 °C -150 °C to -100 °C -100 °C to -50 °C -50 °C to 300 °C 300 °C to 1300 °C  <b>Type R</b> -50 °C to 100 °C 100 °C to 400 °C 400 °C to 600 °C 600 °C to 900 °C 900 °C to 1768 °C	STCP-002 (Rev. 5)	0.35 °C 0.3 °C 0.25 °C 0.2 °C 0.16 °C  0.35 °C 0.25 °C 0.2 °C 0.2 °C  0.3 °C 0.25 °C 0.2 °C 0.2 °C 0.25 °C  0.4 °C 0.3 °C 0.25 °C 0.2 °C 0.22 °C  0.5 °C 0.4 °C 0.4 °C 0.33 °C 0.3 °C

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<p><b>Type S</b> -50 °C to 100 °C 100 °C to 200 °C 200 °C to 400 °C 400 °C to 700 °C 700 °C to 1100 °C 1100 °C to 1768 °C</p> <p><b>Type T</b> -200 °C to -150 °C -150 °C to -100 °C -100 °C to 0 °C 0 °C to 200 °C 200 °C to 400 °C</p> <p><b>Type B</b> 200 °C to 600 °C 600 °C to 1700 °C</p>		<p>0.5 °C 0.4°C 0.4 °C 0.33 °C 0.3 °C 0.3 °C</p> <p>0.3 °C 0.28°C 0.25 °C 0.2 °C 0.17 °C</p> <p>0.5 °C 0.3 °C</p>
<p><b>A5. Resistance Temperature Detectors without Display</b></p> <p>-80 °C to 0 °C 0 °C to 30 °C 30 °C to 250 °C 250 °C to 550 °C</p>	<p>STCP-003 (Rev.5)</p>	<p>17 mK 9mK 17 mK 0.41°C</p>
<p><b>A6. Thermocouple Sensor without Display</b></p> <p><b>Type E</b> -80 °C to 250 °C</p> <p><b>Type J</b> -80 °C to 0 °C 0 °C to 250 °C 250 °C to 500 °C 500 °C to 1000 °C</p>	<p>STCP-004 (Rev.6)</p>	<p>0.4 °C</p> <p>0.6 °C 0.5 °C 0.6 °C 0.7 °C</p>

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<b>Type K</b> -80 °C to 0 °C 0 °C to 250 °C 250 °C to 500 °C 500 °C to 1000 °C 1000 °C to 1290 °C		0.3 °C 0.3 °C 0.5 °C 1.0 °C 2.0 °C
<b>Type N</b> -80 °C to 0 °C 0 °C to 200 °C 200 °C to 400 °C 400 °C to 1000 °C 1000 °C to 1290 °C		0.3 °C 0.3 °C 0.5 °C 1.0 °C 2.0 °C
<b>Type R</b> 0 °C to 500 °C 500 °C to 1000 °C 1000 °C to 1290 °C		0.5 °C 1.0 °C 2.0 °C
<b>Type S</b> 0 °C to 350 °C 350 °C to 1100 °C 1100 °C to 1290 °C		0.9 °C 1.0 °C 2.0 °C
<b>Type T</b> -80 °C to 0 °C 0 °C to 260 °C		0.3 °C 0.2 °C
<b>A7. Digital Indicator with RTD Sensor</b>	STCP-005 (Rev.6)	
-80 °C to -40 °C -40 °C to 0 °C 0 °C to 30 °C 30 °C to 250 °C 250 °C to 550 °C		15 mK 15 mK 9mK 15 mK 0.41 °C

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<b>A8. Digital Indicator with Base Metal Thermocouple</b>  -80 °C to 20 °C 20 °C to 250 °C 250 °C to 500 °C 500 °C to 700 °C 700 °C to 900 °C 900 °C to 1290 °C	STCP-005 (Rev.5)	0.3 °C 0.2 °C 0.7 °C 1.2 °C 1.5 °C 1.7 °C
<b>A9. Digital Indicator with Noble Metal Thermocouple</b>  0 °C to 250 °C 250 °C to 500 °C 500 °C to 1000 °C 1000 °C to 1100 °C 1100 °C to 1290 °C	STCP-005 (Rev.5)	0.4 °C 0.6 °C 1.5 °C 2.2 °C 2.8 °C
<b>A10. Humidity Instruments</b>  -20 °C to 60 °C (10 to 95) % relative humidity at 23  -20 °C to 60 °C (i) (10 to 95) % relative humidity (ii) (95 and above) % relative  Dew Point (-20 °C to 60 °C)	STCP-006 (Rev.5)	0.2 °C (2.0 to 2.2) % relative  0.12 °C (2.0 to 2.2) % relative (2.7 to 2.8) % relative  0.3 °C
<b>A11. Temperature Enclosures (In-house and On-site)</b>  -80 °C to -40 °C -40 °C to 100 °C 100 °C to 350 °C 350 °C to 1290 °C 121 °C Autoclaves and Pressurized Enclosures	STCP-007 (Rev.6)	0.9 °C 0.4°C 1.2°C 3.9 °C 0.3 °C

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<b>A12. Digital Indicator with RTD Sensor (On-site)</b>  -40 °C to 0 °C 0 °C to 100 °C 100 °C to 200 °C 200 °C to 300 °C 300 °C to 500 °C	STCP-008 (Rev.5)	0.3 °C 0.018 °C 0.2 °C 0.3 °C 0.5 °C
<b>A13. Digital Indicator with Base Metal Thermocouple Sensor (On-Site) Digital Display (On-Site)</b>  -40 °C to 0 °C 0 °C to 100 °C 100 °C to 200 °C 200 °C to 300 °C 300 °C to 500 °C 500 °C to 1000 °C	STCP-008 (Rev.5)	0.5 °C 0.3 °C 0.5 °C 0.6 °C 0.8 °C 0.8 °C
<b>A14. Digital RTD Indicators (On-Site)</b>  -200 °C to 550 °C	STCP-009 (Rev.5)	0.09 °C to 0.1 °C
<b>A15. Thermocouple Display Devices (On-Site)</b>  <b>Type E</b> -200 °C to 0 °C 0 °C to 1000 °C  <b>Type J</b> -200 °C to 800 °C  <b>Type K</b> -200 °C to 1200 °C  <b>Type N</b> -200 °C to 1200 °C	STCP-010 (Rev.4)	0.3 °C 0.5 °C  0.5 °C  0.4 °C  0.5 °C

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<b>Type T</b> -200 °C to 0 °C 0 °C to 400 °C		0.3 °C	
<b>A16. Temperature Transmitter with RTD Sensor (In-house &amp; On-site)</b>  -80 °C to 250 °C 250 °C to 550 °C	STCP-011 (Rev.6)		
		<u>In-house</u>	<u>On-site</u>
		17 mK	0.2 °C
		0.41 °C	0.6 °C
<b>A17. Temperature Transmitter with Base Metal Thermocouple Sensor (In-house &amp; On-site)</b>  0 °C to 200 °C 200 °C to 1000 °C 1000 °C to 1200 °C	STCP-011 (Rev.5)		
		<u>In-house</u>	<u>On-site</u>
		0.4 °C	0.6 °C
		0.5 °C	0.8 °C
		1.0 °C	-
<b>A18. Radiation Thermometers</b>  -10 °C to 50 °C 50 °C to 100 °C 100 °C to 350 °C 350 °C to 700 °C  -10 °C to 50 °C 50 °C to 350 °C 350 °C to 700 °C	STCP-012 (Rev.4)  $\epsilon = 1.00$ $\epsilon = 1.00$ $\epsilon = 1.00$ $\epsilon = 1.00$  $\epsilon = 0.90$ to 0.99 $\epsilon = 0.90$ to 0.99 $\epsilon = 0.90$ to 0.99	0.3 °C 0.25 °C 1.5 °C to 2.5 °C 2.0 °C to 3.0 °C  0.5 °C 0.8 °C 3.0 °C to 4.0 °C	



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<b>A19 Liquid-In-Glass (LIG) Thermometer</b>			STCP-013 (Rev. 5)	
Type of Immersion	Min. LIG Graduation (°C)	Max. LIG Graduation (°C)	Temperature Range (°C)	
(i) Total Immersion	0.01	1.0	-80 to -40	0.2 °C
(ii) Total Immersion	0.01	1.0	-40 to 0	0.1 °C
(iii) Total Immersion	0.01	1.0	0 to 200	0.1 °C
(iv) Total Immersion	0.01	1.0	200 to 250	0.3 °C
(v) Partial Immersion	0.01	1.0	-80 to -40	0.4 °C
(vi) Partial Immersion	0.01	1.0	-40 to 0	0.3 °C
(vii) Partial Immersion	0.01	1.0	0 to 150	0.5 °C
(viii) Partial Immersion	0.01	1.0	150 to 200	0.6 °C
(ix) Partial Immersion	0.01	1.0	200 to 250	0.8 °C
<b>A20 Temperature and Humidity Chamber (In-house &amp; On-site)</b>			STCP-014 (Rev. 4)	
-20 °C to 60 °C (Temperature and Dew Point)				0.6 °C to 0.8 °C
(5 ~ 10) °C @ (10 to 55) % RH				0.5 °C / 2.0 % RH
(5 ~ 10) °C @ (55 to 90) % RH				0.4 °C / 2.7 % RH
(5 ~ 10) °C @ (90 to 95) % RH				0.3 °C / 3.3 % RH
(10 ~ 23) °C @ (10 to 55) % RH				0.6 °C / 2.1 % RH
(10 ~ 23) °C @ (55 to 90) % RH				0.4 °C / 2.2 % RH
(10 ~ 23) °C @ (90 to 95) % RH				0.3 °C / 3.2 % RH
(23 ~ 40) °C @ (10 to 55) % RH				0.8 °C / 2.9 % RH
(23 ~ 40) °C @ (55 to 90) % RH				0.2 °C / 2.5 % RH
(23 ~ 40) °C @ (90 to 95) % RH				0.2 °C / 2.1 % RH
(40 ~ 60) °C @ (10 to 55) % RH				0.4 °C / 2.0 % RH
(40 ~ 60) °C @ (55 to 90) % RH				0.4 °C / 2.2 % RH
(40 ~ 60) °C @ (90 to 95) % RH				0.5 °C / 2.8 % RH

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<b>A21. Sensor Calibration Using Fixed Point</b>		
(a) Triple Point of Water (0.01 °C)	STCP-015 (Rev. 3)	3 mK
(b) Gallium Melting Point (29.7646 °C)	STCP-016 (Rev. 3)	3 mK
<b>A22. Multi-Holed Temperature Block Bath Calibration</b>	STCP-017 (Rev. 3)	
Radial and Axial Test		
–40 °C to 250 °C		0.1 °C to 0.4 °C
250 °C to 1100 °C		2.6 °C to 3.8 °C
1100 °C to 1295 °C		4.7 °C
Loading, Stability and Deviation Test		
–40 °C to 250 °C		0.1 °C
250 °C to 1100 °C		1.8 °C to 3.4 °C
1100 °C to 1295 °C		4.0 °C



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<p>(b) Digital Manometers / Differential Digital Manometers and Low pressure Digital Indicators <b>(in-house / On-site)</b></p> <p>-500 pascal to 0 pascal 0 pascal to 250 pascal 250 pascal to 500 pascal 500 pascal to 1000 pascal 1 kilo-pascal to 2.5 kilo-pascal</p> <p>(c) Digital Pressure Indicators <b>(On-site)</b></p> <p>-0.9 bar to 0 bar 0 mbar to 1000 mbar 1000 mbar to 35 bar 35 bar to 70 bar 70 bar to 350 bar 350 bar to 700 bar</p>	<p>SPCP-002 (Rev. 7)</p>	<p>5 pascal 5 pascal 8 pascal 8 pascal 0.025 kilo-pascal</p> <p>1 mbar 1 mbar 0.02 bar 0.05 bar 0.1 bar 0.1 bar</p>
<p><b>B3 Pressure Transmitters</b></p> <p>(a) (-0.9 bar to 1100 bar) <b>(In-house)</b></p> <p>-0.9 bar to 0 bar 0 mbar to 1000 mbar 1 bar to 1100 bar</p> <p>(b) (-0.9 bar to 27.5 bar) <b>(On-site)</b></p> <p>-0.9 bar to 0 bar 0 mbar to 27.5 bar 27.5 bar to 700 bar</p> <p>(c) Low Pressure Transmitters <b>(in-house / On-site)</b></p> <p>-500 pascal to 0 pascal 0 pascal to 250 pascal &gt;250 pascal to 500 pascal &gt;500 pascal to 1000 pascal 1 kilo-pascal to 2.5 kilo-pascal</p>	<p>SPCP-003 (Rev.7)</p>	<p>1 mbar 0.2 mbar 0.018% of Applied Reading</p> <p>2 mbar 0.07 bar 0.1 bar ~ 0.5 bar</p> <p>5 pascal 5 pascal 8 pascal 8 pascal 0.025 kilo-pascal</p>

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<p><b>B4. Analogue Pressure Gauges</b> <b><u>(On-site)</u></b> (-0.9 to 1100) bar</p> <p>(a) Analogue Pressure Gauges <b><u>(On-site)</u></b> -0.9 bar to 0 bar 0 bar to 20 bar 20 bar to 350 bar 350 bar to 700 bar</p> <p>(b) Manometers / Differential Manometers / Magnehelic Pressure Gauges <b><u>(On-site)</u></b> -500 pascal to 0 pascal 0 pascal to 250 pascal 250 pascal to 500 pascal 500 pascal to 1000 pascal 1 kilo-pascal to 2.5 kilo-pascal</p>	<p>SPCP-004 (Rev. 7)</p>	<p>0.0095 bar 0.1 bar 2.1 bar 2.4 bar</p> <p>5 pascal 5 pascal 8 pascal 8 pascal 0.025 kilo-pascal</p>
<p><b>B5. Absolute Pressure Instruments</b> <b><u>(In-house)</u></b></p> <p><b>a. Liquid Media</b> (1.0 to 1100) bar absolute</p> <p><b>b. Gas Media</b></p> <p>i. (0.1 to 1.2) bar absolute</p> <p>ii. (1.2 to 35) bar absolute</p> <p>iii. (35 to 70) bar absolute</p>	<p>SPCP-005 (Rev. 7)</p>	<p>0.018% of Applied Reading + 0.1 mbar absolute</p> <p>0.0011 bar absolute</p> <p>0.018% of Applied Reading + 0.1 mbar absolute</p> <p>0.0071 bar absolute</p>

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<b>C. Electrical Calibration (Stopwatches and Timers)</b>	LDCP-005 (Rev:4)	
<b>C1. Stopwatches (In-house)</b>	Ref: Universal Counter <u>or</u> Stopwatch	1.2 s
a. Analogue Stopwatches 5 s to 18000 s		
b. Digital Stopwatches 1 s to 5 s 5 s to 18000 s	Ref: Universal Counter	0.02 s 0.03 s
a. Digital Stopwatches 1 s to 5 s 5 s to 18000 s	Ref: Stopwatch	0.08 s 0.09 s
<b>C2. Stopwatches (On-site)</b>		
a. Analogue Stopwatches 5 s to 18000 s	Ref: Universal Counter <u>or</u> Stopwatch	1.2 s
b. Digital Stopwatches 1 s to 5 s 5 s to 18000 s	Ref: Universal Counter	0.04 s 0.12 s
c. Digital Stopwatches 1 s to 5 s 5 s to 18000 s	Ref: Stopwatch	0.08 s 0.08 s
<b>C3. Timers (In-house)</b>	Ref: Universal Counter <u>or</u> Stopwatch	1.2 s
a. Analogue Timers 5 s to 28800 s		
b. Digital Timers 0.5 s to 5 s 5 s to 28800 s	Ref: Universal Counter	0.03 s 0.06 s

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<b>C4. Timers (On-site)</b> Analogue Timers 5 s to 28800 s	Ref: Universal Counter <u>or</u> Stopwatch	1.7 s
Digital Timers 0.5 s to 5 s 5 s to 28800 s	Ref: Stopwatch	0.08 s 0.08 s

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

## Approved Signatories:

Mr. Simon Montero Jr.      - For all items

Mr. Gerald Quek Teck Thye      - For A5 - A9, A16, A17, A19, A21(a) and A21(b) only.

Mr. Shetty A. Jagadeesh      - For A1, A2, A10, A11, A18, A20, A22, B and C only.

Mr. Thanish Nagappan      - For A1 – A18, A20, A21(a), A21(b) and A22 and C only.

Mr. Abdul Rashid Bin Othman      - For A1, A2, A5, A7, A11, A12, A14, A16, A20, A21(a), A21(b),  
A22 and B 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 calibration 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.