

Schedule

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Certificate No. : LA-2003-0278-C

Issue No. : 16

Date : 14 April 2016

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Field of Testing : Calibration and Measurement

MEASURED QUANTITIES/ INSTRUMENTS/RANGE TO BE CALIBRATED	METHOD	CALIBRATION AND MEASUREMENT CAPABILITY (CMC*)
A Temperature Calibration		
A1. Resistance Temperature Devices Indicators -200 °C to 200°C 200°C to 850 °C	STCP-001 (Rev. 4)	0.01 °C 0.02 °C
A2. Resistance Temperature Devices Simulators -200 °C to 850 °C	STCP-001 (Rev. 4)	0.01 °C
A3. Thermocouple Simulators Type E -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 Type J -210 °C to -150 °C -150 °C to -100 °C -100 °C to 0 °C 0 °C to 1200 °C	STCP-002 (Rev. 4)	0.38 °C 0.29 °C 0.25 °C 0.20 °C 0.16 °C 0.40 °C 0.31 °C 0.26 °C 0.20 °C

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<p>Type K</p> <p>-270 °C to -150 °C</p> <p>-150 °C to -100 °C</p> <p>-100 °C to 0 °C</p> <p>0 °C to 900 °C</p> <p>900 °C to 1372 °C</p>		<p>0.51 °C</p> <p>0.37 °C</p> <p>0.29 °C</p> <p>0.25 °C</p> <p>0.28 °C</p>
<p>Type N</p> <p>-270 °C to -150 °C</p> <p>-150 °C to -100 °C</p> <p>-100 °C to 100 °C</p> <p>100 °C to 200 °C</p> <p>200 °C to 1300 °C</p>		<p>0.60 °C</p> <p>0.42 °C</p> <p>0.33 °C</p> <p>0.24 °C</p> <p>0.22 °C</p>
<p>Type R</p> <p>-50 °C to 100 °C</p> <p>100 °C to 400 °C</p> <p>400 °C to 600 °C</p> <p>600 °C to 900 °C</p> <p>900 °C to 1768 °C</p>		<p>0.78 °C</p> <p>0.49 °C</p> <p>0.40 °C</p> <p>0.33 °C</p> <p>0.31 °C</p>
<p>Type S</p> <p>-50 °C to 100 °C</p> <p>100 °C to 200 °C</p> <p>200 °C to 400 °C</p> <p>400 °C to 700 °C</p> <p>700 °C to 1768 °C</p>		<p>0.78 °C</p> <p>0.56 °C</p> <p>0.44 °C</p> <p>0.40 °C</p> <p>0.36 °C</p>
<p>Type T</p> <p>-270 °C to -150 °C</p> <p>-150 °C to -100 °C</p> <p>-100 °C to 0 °C</p> <p>0 °C to 200 °C</p> <p>200 °C to 400 °C</p>		<p>0.43 °C</p> <p>0.36 °C</p> <p>0.28 °C</p> <p>0.22 °C</p> <p>0.17 °C</p>

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<p>A4. Thermocouple Indicators</p> <p>Type E</p> <p>-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</p> <p>Type J</p> <p>-210 °C to -150 °C -150 °C to -100 °C -100 °C to 100 °C 100 °C to 1200 °C</p> <p>Type K</p> <p>-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</p> <p>Type N</p> <p>-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</p> <p>Type R</p> <p>-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</p>	<p>STCP-002 (Rev. 4)</p>	<p>0.42 °C 0.29 °C 0.24 °C 0.18 °C 0.15 °C</p> <p>0.39 °C 0.30 °C 0.25 °C 0.19 °C</p> <p>0.53 °C 0.36 °C 0.29 °C 0.25 °C 0.27 °C</p> <p>0.59 °C 0.41 °C 0.31 °C 0.26 °C 0.20 °C</p> <p>0.63 °C 0.46 °C 0.37 °C 0.31 °C 0.29 °C</p>

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<p>Type S -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>Type T -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>0.63 °C 0.53 °C 0.47 °C 0.37 °C 0.34 °C 0.31 °C</p>
<p>A5. Resistance Temperature Detectors Without Display</p> <p>-80 °C to 0 °C 0 °C to 30 °C 30 °C to 250 °C 250 °C to 500 °C</p>	STCP-003 (Rev. 4)	<p>30 mK 11 mK 30 mK 0.41 °C</p>
<p>A6. Thermocouple Sensor without Display</p> <p>Type E -80 °C to 250 °C</p> <p>Type J -80 °C to 0 °C 0 °C to 250 °C 250 °C to 500 °C 500 °C to 1000 °C</p>	STCP-004 (Rev. 6)	<p>0.7 °C 0.7 °C 0.7 °C 0.9 °C 1.5 °C</p>

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<p>Type K -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</p> <p>Type N -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</p> <p>Type R 0 °C to 500 °C 500 °C to 1000 °C 1000 °C to 1290 °C</p> <p>Type S 350 °C to 1100 °C 1100 °C to 1290 °C</p> <p>Type T -80 °C to 0 °C 0 °C to 250 °C</p>		<p>0.5 °C 0.3 °C 0.5 °C 1.4 °C 2.7 °C</p> <p>0.7 °C 0.4 °C 0.5 °C 1.4 °C 2.8 °C</p> <p>0.5 °C 1.4 °C 2.7 °C</p> <p>1.4 °C 2.2 °C</p> <p>0.4 °C 0.3 °C</p>
<p>A7. Digital Indicator With RTD Sensor</p> <p>-80 °C to -40 °C -40 °C to 0 °C 0 °C to 250 °C 250 °C to 550 °C</p>	STCP-005 (Rev. 5)	<p>34 mK 30 mK 64 mK 0.41 °C</p>

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A8. Digital Indicator with Base Metal Thermocouple -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)	0.5 °C 0.6 °C 1.8 °C 2.1 °C 2.3 °C 2.9 °C
A9. Digital Indicator with Noble Metal Thermocouple 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
A10. Humidity Instruments -20 °C to 60 °C (25 to 95) % relative humidity at 23 °C -20 °C to 60 °C (25 to 95) % relative humidity	STCP-006 (Rev. 5)	0.3 °C 3.6 % relative humidity 0.12 °C (2.0 to 9.0) % relative humidity
A11. Temperature Enclosure -80 °C to -40 °C -40 °C to 100 °C 100 °C to 350 °C 350 °C to 1290 °C	STCP-007 (Rev. 5)	0.9 °C 1.3 °C 2.7 °C 3.9 °C

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A12. Digital Indicator with RTD Sensor on Site -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. 4)	0.5 °C 0.2 °C 0.7 °C 1.9 °C 3.0 °C
A13. Digital Indication with Base Metal Thermocouple Sensor on Site Digital Display On Site -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. 4)	2.0 °C 1.9 °C 2.0 °C 2.6 °C 3.5 °C
A14. Digital RTD Indicators (On-Site) -200 °C to 500 °C	STCP-009 (Rev. 4)	0.2 °C
A15. Thermocouple Display Device (On-Site) Type E -200 °C to 0 °C -0 °C to 1000 °C Type J -200 °C to 800 °C Type K -200 °C to 1200 °C	STCP-010 (Rev. 4)	0.8 °C 0.7 °C 0.9 °C 0.8 °C

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<p>Type N -200 °C to 1200 °C</p> <p>Type T -200 °C to 0 °C 0 °C to 400 °C</p>		<p>0.8 °C</p> <p>0.8 °C 0.7 °C</p>
<p>A16. Temperature Transmitter with RTD Sensor</p> <p>-80°C to 200 °C 200 °C to 500 °C</p>	STCP-011 (Rev. 5)	<p>0.2 °C 0.5 °C</p>
<p>A17. Temperature Transmitter with Base Thermocouple Sensor</p> <p>0°C to 200 °C 200°C to 1000°C 1000°C to 1200 °C</p>	STCP-011 (Rev. 5)	<p>2.2 °C 2.5 °C 3.4 °C</p>
<p>A18. Radiation Thermometers</p> <p>0°C 50°C to 700°C</p> <p>0°C 50°C to 700°C</p>	<p>STCP-012 (Rev. 4)</p> <p>$\epsilon = 1.00$ $\epsilon = 1.00$</p> <p>$\epsilon = 0.90$ to 0.99 $\epsilon = 0.90$ to 0.99</p>	<p>0.4 °C 5.8 °C to 6.5 °C</p> <p>1.8 °C 6.0 °C to 6.8 °C</p>
<p>A19. Liquid-In-Glass Thermometer</p> <p>-80 °C to 250 °C</p>	STCP-013 (Rev. 4)	29 mK

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A20. Temperature and Humidity Chamber -20 °C to 60 °C (20 to 90) % relative humidity	STCP-014 (Rev. 2)	0.6 °C to 0.8 °C (2.3 to 7.8) % relative humidity
A21. Sensor Calibration Using Fixed Point (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
A22. Multi-Holed Temperature Block Bath Calibration Radial and Axial Test -40 °C to 250 °C 250 °C to 1100 °C 1100 °C to 1295 °C Loading, Stability and Deviation Test -40 °C to 250 °C 250 °C to 1100 °C 1100 °C to 1295 °C	STCP-017 (Rev. 2)	0.1 °C to 0.4 °C 2.6 °C to 3.8 °C 4.7 °C 0.1 °C 1.8 °C to 3.4 °C 4.0 °C

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B. Mechanical Calibration (Pressure)		
B1. Analogue Pressure Gauges (-0.9 to 1100) bar -0.9 bar to 0 bar 0 mbar to 1000 mbar 1000 mbar to 35 bar 35 bar to 1100 bar	SPCP-001 (Rev. 5)	3.0 mbar 3.0 mbar 0.06 bar 1.2 bar
B2. Digital Pressure Indicators (-0.9 to 1100) bar -0.9 bar to 0 bar 0 mbar to 1000 mbar 1000 mbar to 35 bar 35 bar to 350 bar 350 bar to 1100 bar	SPCP-002 (Rev. 5)	0.18 mbar 0.015 mbar to 0.17 mbar 0.34 mbar to 4.0 mbar 0.06 bar 0.13 bar
B3. Pressure Transmitters (-0.9 to 1100) bar -0.9 bar to 0 bar 0 mbar to 1000 mbar 1 bar to 1100 bar	SPCP-003 (Rev. 5)	1 mbar 0.08 mbar 0.018 % of Applied Reading
B4. Analogue Pressure Gauge (On-Site) (-0.9 to 700 bar) -0.9 bar to 0 bar 0 to 20 bar 20 bar to 350 bar 350 bar to 700 bar	SPCP-004 (Rev. 5)	0.0095 bar 0.1 bar 2.1 bar 2.4 bar

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B5. Absolute Pressure Instruments (0.1 to 1100 bar absolute) 1.0 bar to 1100 bar absolute (Liquid Media) 0.1 bar to 1.2 bar absolute (Gas Media) 1.2 bar to 35 bar absolute (Gas Media) 35 bar to 70 bar absolute (Gas Media)	SPCP-005 (Rev. 5)	 0.018% of Applied Reading + 0.1 mbar 0.0011 bar absolute 0.018% of Applied Reading + 0.1 mbar 0.0071 bar

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

Approved Signatories

Mr Abd Rashid Bin Othman - For A1- A5, A10 - A11, A14 - A15, A18 – A20, A21(a), A22 and B only.

Mr Simon Montero Jr - For items A1-A9, A11- A17, and A21 only.

Note :

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005. A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 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 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 **Quality Management Systems — Requirements** and are aligned with its pertinent requirements.