

CALIBRATION LABORATORIES

NVLAP LAB CODE 200502-0


SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CALIBRATION AND MEASUREMENT CAPABILITIES (CMC) ^{Notes 1,2}

Measured Parameter or Device Calibrated	Range	Expanded Uncertainty ^{Note 3}	Remarks
ELECTROMAGNETICS – DC/LOW FREQUENCY			
DC RESISTANCE and CURRENT (20/E05)			
DC Resistance – Generate	0 Ω to 11 Ω	8.1 mΩ	Fluke 5522A
	11 Ω to 33 Ω	13 mΩ	
	33 Ω to 110 Ω	19 mΩ	
	110 Ω to 330 Ω	26 mΩ	
	330 Ω to 1.1 kΩ	130 mΩ	
	1.1 kΩ to 3.3 kΩ	260 mΩ	
	3.3 kΩ to 11 kΩ	1.3 Ω	
	11 kΩ to 33 kΩ	1.9 Ω	
	33 kΩ to 110 kΩ	20 Ω	
	110 kΩ to 330 kΩ	25 Ω	
	330 kΩ to 1.1 MΩ	690 Ω	
	1.1 MΩ to 3.3 MΩ	740 Ω	
	3.3 MΩ to 11 MΩ	59 kΩ	
	11 MΩ to 33 MΩ	60 kΩ	
	33 MΩ to 110 MΩ	5.8 MΩ	
	110 MΩ to 330 MΩ	5.8 MΩ	
	330 MΩ to 1.1 GΩ	14 MΩ	

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DC Resistance – Measure	0 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 kΩ 1 kΩ to 10 kΩ 10 kΩ to 100 kΩ 100 kΩ to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ 100 MΩ to 1 GΩ	0.000 68 Ω 0.0021 Ω 0.012 Ω 0.12 Ω 1.2 Ω 20 Ω 0.70 kΩ 0.81 kΩ 5.8 MΩ	Keysight 3458A
DC Current – Generate	0 mA to 300 mA >300 μA to 3.3 mA >3.3 mA to 33 mA >33 mA to 330 mA >330 mA to 1.1 A >1.1 A to 3A 3 A to 11 A 11 A to 20.5 A	63 nA 430 nA 6.1 μA 170 μA 270 μA 1.0 mA 4.7 mA 17 mA	Fluke 5522A
DC Current – Measure	0 mA to 100 μA 100 μA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A	9.9 nA 47 nA 450 nA 6.5 μA 160 μA	Keysight 3458A
DC VOLTAGE (20/E06)			
DC Voltage – Generate	0 mV to 329 mV 0 mV to 3.29 V 0 V to 32.9 V 30 V to 329.9 V 100 V to 1020 V	6.5 μV 43 μV 530 μV 6.2 mV 20 mV	Fluke 5522A
DC Voltage – Measure	0 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1 kV	1.8 μV 12 μV 110 μV 1.3 mV 15 mV	Keysight 3458A

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THERMODYNAMIC			
LABORATORY THERMOMETERS, DIGITAL AND ANALOG (20/T03)			
Thermometer by Comparison	-196 °C	0.02 °C	PRT Type S Reference SPRT
	-80 °C to 0 °C	0.02 °C	
	0 °C to 100 °C	0.03 °C	
	100 °C to 200 °C	0.03 °C	
	200 °C to 300 °C	0.04 °C	
	300 °C to 420 °C	0.05 °C	
	420 °C to 800 °C	0.39 °C	
	-196 °C	0.011 °C	
	-80 °C to 0 °C	0.016 °C	
	0 °C to 100 °C	0.020 °C	
	100 °C to 200 °C	0.024 °C	
	200 °C to 300 °C	0.028 °C	
	300 °C to 420 °C	0.036 °C	
	Fixed Point	0.01 °C	
Fixed Point	29.7646 °C	0.0033 °C	MPGa
TEMPERATURE INDICATORS (20/T08)			
Digital/Analog Thermocouple Indicators – Simulate and Measure			Fluke 5522A
Type B	600 °C to 800 °C	0.39 °C	
	800 °C to 1000 °C	0.32 °C	
	1000 °C to 1550 °C	0.30 °C	
	1550 °C to 1820 °C	0.28 °C	
Type C	0 °C to 150 °C	0.31 °C	
	150 °C to 650 °C	0.29 °C	
	650 °C to 1000 °C	0.32 °C	
	1000 °C to 1800 °C	0.45 °C	
	1800 °C to 2316 °C	0.69 °C	

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Type E	-250 °C to -100 °C	0.41 °C	
	-100 °C to -25 °C	0.18 °C	
	-25 °C to 350 °C	0.17 °C	
	350 °C to 650 °C	0.18 °C	
	650 °C to 1000 °C	0.21 °C	
Type J	-210 °C to -100 °C	0.24 °C	
	-100 °C to -30 °C	0.16 °C	
	-30 °C to 150 °C	0.15 °C	
	150 °C to 760 °C	0.17 °C	
	760 °C to 1200 °C	0.22 °C	
Type K	-200 °C to -100 °C	0.32 °C	
	-100 °C to -25 °C	0.23 °C	
	-25 °C to 120 °C	0.22 °C	
	120 °C to 1000 °C	0.27 °C	
	1000 °C to 1372 °C	0.37 °C	
Type N	-200 °C to -100 °C	0.36 °C	
	-100 °C to -25 °C	0.25 °C	
	-25 °C to 120 °C	0.24 °C	
	120 °C to 410 °C	0.23 °C	
	410 °C to 1300 °C	0.29 °C	
Type R	0 °C to 250 °C	0.40 °C	
	250 °C to 400 °C	0.33 °C	
	400 °C to 1000 °C	0.34 °C	
	1000 °C to 1767 °C	0.40 °C	
Type S	0 °C to 250 °C	0.50 °C	
	250 °C to 1000 °C	0.22 °C	
	1000 °C to 1400 °C	0.17 °C	
	1400 °C to 1767 °C	0.16 °C	

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Type T	-250 °C to -150 °C -150 °C to 0 °C 0 °C to 120 °C 120 °C to 400 °C	0.50 °C 0.22 °C 0.17 °C 0.16 °C	
Digital/Analog RTD Indicators – Simulate			Fluke 5522A
Pt 385, 100 Ω	-200 °C to -80 °C -80 °C to 0 °C 0 °C to 100 °C 100 °C to 300 °C 300 °C to 400 °C 400 °C to 630 °C 600 °C to 800 °C	0.039 °C 0.039 °C 0.054 °C 0.070 °C 0.078 °C 0.094 °C 0.18 °C	
Pt 385, 200 Ω	-200 °C to -80 °C -80 °C to 0 °C 0 °C to 100 °C 100 °C to 260 °C 260 °C to 300 °C 300 °C to 400 °C 400 °C to 600 °C 600 °C to 630 °C	0.031 °C 0.031 °C 0.031 °C 0.040 °C 0.093 °C 0.10 °C 0.11 °C 0.12 °C	
Pt 385, 500 Ω	-200 °C to -80 °C -80 °C to 0 °C 0 °C to 100 °C 100 °C to 260 °C 260 °C to 300 °C 300 °C to 400 °C 400 °C to 600 °C 600 °C to 630 °C	0.031 °C 0.039 °C 0.039 °C 0.047 °C 0.088 °C 0.089 °C 0.098 °C 0.11 °C	
Pt 385, 1000 Ω	-200 °C to -80 °C -80 °C to 0 °C 0 °C to 100 °C	0.023 °C 0.023 °C 0.043 °C	

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty ^{Note 3}	Remarks
Pt 3926, 100 Ω	100 °C to 260 °C	0.040 °C	
	260 °C to 300 °C	0.047 °C	
	300 °C to 400 °C	0.055 °C	
	400 °C to 600 °C	0.055 °C	
	600 °C to 630 °C	0.18 °C	
Pt 3926, 100 Ω	-200 °C to -80 °C	0.039 °C	
	-80 °C to 0 °C	0.039 °C	
	0 °C to 100 °C	0.054 °C	
	100 °C to 300 °C	0.070 °C	
	300 °C to 400 °C	0.078 °C	
	400 °C to 630 °C	0.093 °C	
Pt 3926, 100 Ω	-200 °C to -190 °C	0.19 °C	
	-190 °C to -80 °C	0.031 °C	
	-80 °C to 0 °C	0.039 °C	
	0 °C to 100 °C	0.047 °C	
	100 °C to 260 °C	0.054 °C	
	260 °C to 300 °C	0.062 °C	
	300 °C to 400 °C	0.071 °C	
	400 °C to 600 °C	0.079 °C	
	600 °C to 630 °C	0. °C	
PtNi 385, 120 Ω	-80 °C to 0 °C	0.062 °C	
	0 °C to 100 °C	0.062 °C	
	100 °C to 260 °C	0.11 °C	
Cu 427, 10 Ω	-100 °C to 260 °C	0.032 °C	
THERMOCOUPLES (20/T11)			
Base Metal by Comparison			
Type E	-196 °C	0.51 °C	PRT
	-80 °C to 420 °C	0.51 °C	Type S Reference
	400 °C to 1000 °C	0.57 °C	



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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty ^{Note 3}	Remarks
Type J	-196 °C	0.56 °C	PRT
	-80 °C to 420 °C	0.56 °C	Type S Reference
	400 °C to 1100 °C	0.62 °C	
	1100 °C to 1204 °C	0.85 °C	
Type K	-196 °C	0.56 °C	PRT
	-80 °C to 420 °C	0.56 °C	Type S Reference
	400 °C to 1100 °C	0.62 °C	
	1100 °C to 1204 °C	0.86 °C	Type B or Type S Reference
	1100 °C to 1372 °C	1.5 °C	
Type N	-196 °C	0.56 °C	PRT
	-80 °C to 420 °C	0.56 °C	Type S Reference
	400 °C to 1100 °C	0.63 °C	
	1100 °C to 1204 °C	0.86 °C	Type B or Type S Reference
	1100 °C to 1300 °C	1.2 °C	
Type T	-196 °C	0.26 °C	PRT
	-80 °C to 420 °C	0.27 °C	
Noble Metal by Comparison			
Type B	200 °C to 420 °C	0.40 °C	PRT
	400 °C to 1100 °C	0.43 °C	Type S Reference
	1100 °C to 1204 °C	0.72 °C	
	1204 °C to 1300 °C	1.1 °C	Type B or Type S Reference
	1300 °C to 1400 °C	1.5 °C	
	1400 °C to 1500 °C	1.8 °C	
	1500 °C to 1550 °C	2.0 °C	
Type R	-50 °C to 420 °C	0.36 °C	PRT
	400 °C to 1100 °C	0.45 °C	Type S Reference
	1100 °C to 1204 °C	0.74 °C	
	1204 °C to 1300 °C	1.1 °C	Type B or Type S Reference
	1300 °C to 1400 °C	1.5 °C	
	1400 °C to 1450 °C	1.7 °C	

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Measured Parameter or Device Calibrated	Range	Expanded Uncertainty ^{Note 3}	Remarks
Type S	-50 °C to 420 °C	0.35 °C	PRT
	400 °C to 1100 °C	0.44 °C	Type S Reference
	1100 °C to 1204 °C	0.73 °C	
	1204 °C to 1300 °C	1.1 °C	Type B or Type S Reference
	1300 °C to 1450 °C	1.5 °C	
END			

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Notes

Note 1: A Calibration and Measurement Capability (CMC) is a description of the best result of a calibration or measurement (result with the smallest uncertainty of measurement) that is available to the laboratory's customers under normal conditions, when performing more or less routine calibrations of nearly ideal measurement standards or instruments. The CMC is described in the laboratory's scope of accreditation by: the measurement parameter/device being calibrated, the measurement range, the uncertainty associated with that range (see note 3), and remarks on additional parameters, if applicable.

Note 2: Calibration and Measurement Capabilities are traceable to the national measurement standards of the U.S. or to the national measurement standards of other countries and are thus traceable to the internationally accepted representation of the appropriate SI (Système International) unit.

Note 3: The uncertainty associated with a measurement in a CMC is an expanded uncertainty with a level of confidence of approximately 95 %, typically using a coverage factor of $k = 2$. However, laboratories may report a coverage factor different than $k = 2$ to achieve the 95 % level of confidence. Units for the measurand and its uncertainty are to match. Exceptions to this occur when marketplace practice employs mixed units, such as when the artifact to be measured is labeled in non-SI units and the uncertainty is given in SI units (Example: 5 lb weight with uncertainty given in mg).

Note 3a: The uncertainty of a specific calibration by the laboratory may be greater than the uncertainty in the CMC due to the condition and behavior of the customer's device and specific circumstances of the calibration. The uncertainties quoted do not include possible effects on the calibrated device of transportation, long term stability, or intended use.

Note 3b: As the CMC represents the best measurement results achievable under normal conditions, the accredited calibration laboratory shall not report smaller uncertainty of measurement than that given in a CMC for calibrations or measurements covered by that CMC.

Note 3c: As described in Note 1, CMCs cover calibrations and measurements that are available to the laboratory's customers under *normal conditions*. However, the laboratory may have the capability to offer special tests, employing special conditions, which yield calibration or measurement results with lower uncertainties. Such special tests are not covered by the CMCs and are outside the laboratory's scope of accreditation. In this case, NVLAP requirements for the labeling, on calibration reports, of results outside the laboratory's scope of accreditation apply. These requirements are set out in Annex A.5 of NIST Handbook 150, Procedures and General Requirements.

Note 4: Uncertainties associated with field service calibration may be greater as they incorporate on-site environmental contributions, transportation effects, or other factors that affect the measurements. (This note applies only if marked in the body of the scope.)

Note 5: Uncertainty values listed with percent (%) are percent of reading or generated value unless otherwise noted.

Note 6: NVLAP accreditation is the formal recognition of specific calibration capabilities. Neither NVLAP nor NIST guarantee the accuracy of individual calibrations made by accredited laboratories.

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