



PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

Perry Johnson Laboratory Accreditation, Inc. has assessed the Laboratory of:

AG Metrology® S.r.l.

Strada San Faustino, 155 N, 41124 Modena (MO) Italy

(Hereinafter called the Organization) and hereby declares that Organization is accredited in accordance with the recognized International Standard:

ISO/IEC 17025:2017

This accreditation demonstrates technical competence or a defined scope and the operation of a laboratory quality management system (as outlined by the joint ISO-ILAC-IAF Communiqué dated April 2017):

Electrical, Mechanical, and Thermodynamic Calibration
(As detailed in the supplement)

Accreditation claims Or such testing and/or calibration services shall only be made addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above, and the Organization hereby covenants with the Accreditation body's duty to observe and comply with the said rules.

Or PJLA:

Tracy Szerszen
President/Operations Manager

Initial Accreditation Date:

May 8, 2020

Issue Date:

May 8, 2020

Expiration Date:

July 31, 2022

Accreditation No.:

108949

Certificate No.:

L20-291

Perry Johnson Laboratory
Accreditation, Inc. (PJLA)
755 W. Big Beaver, Suite 1325
Troy, Michigan 48084

The validity of this certificate is maintained through ongoing assessments based on a continuous accreditation cycle. The validity of this certificate should be confirmed through the PJLA website: www.pjllabs.com



Certificate of Accreditation: Supplement

AG Metrology® S.r.l

Strada San Faustino, 155 N, 41124, Modena (MO), Italy
 Dr. Giorgia Calzolari Phone: +39 059 3970648

Accreditation is granted to the facility to perform the following calibrations:

Electrical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (\pm)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Equipment to Measure DC Voltage ^F	Up to 100 mV	0.001 2 % of reading + 1.2 μ V	Datron 1271 Datron 4700 Euramet cg-15 Sit/Tec-008/05
	0.1 to 1 V	0.001 1 % of reading + 2 μ V	
	1 V to 10 V	0.000 83 % of reading + 12 μ V	
	10 V to 100 V	0.001 1 % of reading + 206 μ V	
	100 V to 1 000 V	0.001 2 % of reading + 2.4 mV	
Equipment to Measure DC Current ^F	Up to 100 μ A	0.007 2 % of reading + 2.6 nA	
	0.1 μ A to 1 mA	0.006 5 % of reading + 19 nA	
	1 mA to 10 mA	0.006 5 % of reading + 183 nA	
	10 mA to 100 mA	0.011 % of reading + 2.2 μ A	
	0.1 mA to 1 A	0.019 % of reading + 50 μ A	
Equipment to Measure Resistance ^F	Up to 10 Ω	0.004 5 % of reading + 406 $\mu\Omega$	
	10 Ω to 100 Ω	0.0032 % of reading + 4.1 m Ω	
	0.1 k Ω to 1 k Ω	0.002 4 % of reading + 40.1 m Ω	
	1 k Ω to 10 k Ω	0.002 7 % of reading + 401 m Ω	
	10 k Ω to 100 k Ω	0.002 6 % of reading + 4.1 Ω	
	1 Ω	0.11 m Ω	
	1.9 Ω	0.17 m Ω	
	10 Ω	0.52 m Ω	
	19 Ω	0.90 m Ω	
	100 Ω	3.4 m Ω	
	190 Ω	4.8 m Ω	
	1 k Ω	24 m Ω	
	1.9 k Ω	50 m Ω	
	10 k Ω	0.23 Ω	
	19 k Ω	0.48 Ω	
	100 k Ω	2.6 Ω	
	190 k Ω	7.8 Ω	
	1 M Ω	50 Ω	
1.9 M Ω	0.22 k Ω		
10 M Ω	1.0 k Ω		
19 M Ω	15 k Ω		
100 M Ω	69 k Ω		



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Equipment to Output DC Voltage ^F	Up to 100 mV	0.001 1 % of reading + 0.49 μ V	Datron 1271 CEM EL-010 Sit/Tec-008/05
	0.1 V to 1 V	0.000 83 % of reading + 1.8 μ V	
	1 V to 10 V	0.000 72 % of reading + 6.3 μ V	
	10 V to 100 V	0.000 83 % of reading + 117 μ V	
	100 V to 1 000 V	0.001 1 % of reading + 2.1 mV	
Equipment to Output DC Current ^F	Up to 100 μ A	0.005 1 % of reading + 1.3 nA	
	0.1 mA to 1 mA	0.005 1 % of reading + 7.9 nA	
	1 mA to 10 mA	0.0051 % of reading + 79 nA	
	10 mA to 100 mA	0.011 % of reading + 1.3 μ A	
	0.1 A to 1 A	0.016 % of reading + 24 μ A	
Equipment to Output Resistance ^F	Up to 10 Ω	0.011 % of reading + 0.11 m Ω	
	10 Ω to 100 Ω	0.002 9 % of reading + 0.42 m Ω	
	0.1 k Ω to 1 k Ω	0.002 6 % of reading + 4.2 m Ω	
	1 k Ω to 10 k Ω	0.002 6 % of reading + 42 m Ω	
	10 k Ω to 100 k Ω	0.002 6 % of reading + 413 m Ω	
	0.1 M Ω to 1 M Ω	0.003 6 % of reading + 5.4 Ω	
	1 M Ω to 10 M Ω	0.021 % of reading + 223.7 Ω	
	10 M Ω to 100 M Ω	0.073 % of reading + 14.2 k Ω	
Equipment to Measure DC Voltage ^O	Up to 200 mV	0.002 2 % of reading + 3.5 μ V	Datron 1271 MicroCal 20 DPC Euramet cg-15 Sit/Tec-008/05
	0.2 V to 2 V	0.002 2 % of reading + 16 μ V	
	2 V to 20 V	0.002 17 % of reading + 163 μ V	
Equipment to Measure DC Current ^O	Up to 50 mA	0.023 % of reading + 1.1 μ A	
Equipment to Measure Resistance ^O	Up to 500 Ω	0.0203 % of reading + 24 m Ω	
	0.5 k Ω to 5 k Ω	0.0202 % of reading + 232 m Ω	
Equipment to Measure AC Voltage At the Listed Frequencies ^F			Datron 1271 Datron 4700 Euramet cg-15 Sit/Tec-008/05
40 Hz to 2 kHz	Up to 100 mV	0.034 % of reading + 18 μ V	
2 kHz to 20 kHz	Up to 100 mV	0.046 % of reading + 27 μ V	
20 kHz to 100 kHz	Up to 100 mV	0.18 % of reading + 46 μ V	



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Equipment to Measure AC Voltage At the Listed Frequencies ^F			Datron 1271 Datron 4700 Euramet cg-15 Sit/Tec-008/05
40 Hz to 2 kHz	Up to 100 mV	0.034 % of reading + 18 μV	
2 kHz to 20 kHz	Up to 100 mV	0.046 % of reading + 27 μV	
20 kHz to 100 kHz	Up to 100 mV	0.18 % of reading + 46 μV	
Equipment to Measure AC Voltage At the Listed Frequencies ^F			
40 Hz to 2 kHz	0.1 V to 1 V	0.029 % of reading + 103 μV	
2 kHz to 20 kHz	0.1 V to 1 V	0.03 % of reading + 103 μV	
20 kHz to 100 kHz	0.1 V to 1 V	0.12 % of reading + 406 μV	
100 kHz to 300 kHz	0.1 V to 1 V	1.5 % of reading + 21 mV	
300 kHz to 1 MHz	0.1 V to 1 V	2.1 % of reading + 41 mV	
Equipment to Measure AC Voltage At the Listed Frequencies ^F			
40 Hz to 2 kHz	1 V to 10 V	0.029 % of reading + 1.1 mV	
2 kHz to 20 kHz	1 V to 10 V	0.029 % of reading + 1.1 mV	
20 kHz to 100 kHz	1 V to 10 V	0.12 % of reading + 4.1 mV	
100 kHz to 300 kHz	1 V to 10 V	1.1 % of reading + 201 mV	
300 kHz to 1 MHz	1 V to 10 V	2.1 % of reading + 401 mV	
Equipment to Measure AC Voltage At the Listed Frequencies ^F			
40 Hz to 2 kHz	10 V to 100 V	0.025 % of reading + 11 mV	
2 kHz to 20 kHz	10 V to 100 V	0.025 % of reading + 11 mV	
20 kHz to 100 kHz	10 V to 100 V	0.11 % of reading + 41 mV	
Equipment to Measure AC Voltage At the Listed Frequencies ^F			
40 Hz to 2 kHz	100 V to 1 000 V	0.037 % of reading + 153 mV	
2 kHz to 20 kHz	100 V to 1 000 V	0.035 % of reading + 248 mV	
20 kHz to 100 kHz	100 V to 1 000 V	0.17 % of reading + 441 mV	
Equipment to Output AC Voltage At the Listed Frequencies ^F			Datron 1271 CEM EL-010 Sit/Tec-008/05
40 Hz to 2 kHz	Up to 100 mV	0.026 % of reading + 15 μV	
2 kHz to 20 kHz	Up to 100 mV	0.041 % of reading + 13 μV	
20 kHz to 100 kHz	Up to 100 mV	0.17 % of reading + 45 μV	
Equipment to Output AC Voltage At the Listed Frequencies ^F			
40 Hz to 2 kHz	0.1 V to 1 V	0.021 % of reading + 102 μV	
2 kHz to 20 kHz	0.1 V to 1 V	0.03 % of reading + 53 μV	
20 kHz to 100 kHz	0.1 V to 1 V	0.11 % of reading + 405 μV	
100 kHz to 300 kHz	0.1 V to 1 V	1.1 % of reading + 11 mV	
300 kHz to 1 MHz	0.1 V to 1 V	2.1 % of reading + 41 mV	



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Equipment to Output AC Voltage At the Listed Frequencies ^F			Datron 1271 CEM EL-010 Sit/Tec-008/05
40 Hz to 2 kHz	1 V to 10 V	0.021 % of reading + 1001 μ V	
2 kHz to 20 kHz	1 V to 10 V	0.021 % of reading + 501 μ V	
20 kHz to 100 kHz	1 V to 10 V	0.11 % of reading + 4.1 mV	
100 kHz to 300 kHz	1 V to 10 V	1.1 % of reading + 101 mV	
300 kHz to 1 MHz	1 V to 10 V	2.1 % of reading + 401 mV	
Equipment to Output AC Voltage At the Listed Frequencies ^F			
40 Hz to 2 kHz	10 V to 100 V	0.021 % of reading + 10.1 mV	
2 kHz to 20 kHz	10 V to 100 V	0.021 % of reading + 5.1 mV	
20 kHz to 100 kHz	10 V to 100 V	0.11 % of reading + 41 mV	
Equipment to Output AC Voltage At the Listed Frequencies ^F			
40 Hz to 2 kHz	100 V to 1 000 V	0.026 % of reading + 141 mV	
2 kHz to 20 kHz	100 V to 1 000 V	0.031 % of reading + 121 mV	
20 kHz to 100 kHz	100 V to 1 000 V	0.17 % of reading + 441 mV	
Equipment to Measure AC Current At the Listed Frequencies ^F			
10 Hz to 5 kHz	Up to 100 μ A	0.069 % of reading + 33 nA	
10 Hz to 5 kHz	0.1 mA to 1 mA	0.048 % of reading + 291 nA	
10 Hz to 5 kHz	1 mA to 10 mA	0.048 % of reading + 2.7 μ A	
10 Hz to 5 kHz	10 mA to 100 mA	0.048 % of reading + 27 μ A	
10 Hz to 5 kHz	0.1 A to 1 A	0.17 % of reading + 833 μ A	
Equipment to Output AC Current At the Listed Frequencies ^F			Datron 1271 CEM EL-010 Sit/Tec-008/05
10 Hz to 5 kHz	Up to 100 μ A	0.041 % of reading + 32.1 nA	
10 Hz to 5 kHz	0.1 mA to 1 mA	0.032 % of reading + 240 nA	
10 Hz to 5 kHz	1 mA to 10 mA	0.032 % of reading + 2.2 μ A	
10 Hz to 5 kHz	10 mA to 100 mA	0.032 % of reading + 21 μ A	
10 Hz to 5 kHz	0.1 A to 1 A	0.16 % of reading + 807 μ A	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type Pt/Pd ^F	0 °C to 1 500 °C	0.17 °C with 0 °C RJ 0.35 °C with internal RJ	Electrical Simulation of Thermocouple Output Using Datron 4700 Euramet cg-11



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Temperature Calibration, Indication and Control Equipment used with Thermocouple Type Au/Pt ^F	0 °C to 1 000 °C	0.15 °C with 0° C RJ 0.35 °C with internal RJ	Electrical Simulation of Thermocouple Output Using Datron 4700 Euramet cg-11
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type R ^F	-50 °C to 1 768 °C	0.21 °C with 0° C RJ 0.44 °C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type S ^F	-50 °C to 1 768 °C	0.20 °C with 0° C RJ 0.44 °C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type B ^F	420 °C to 1 820 °C	0.20 °C with 0° C RJ 0.42 °C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type J ^F	-200 °C to 1 200 °C	0.04 °C with 0° C RJ 0.19 °C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type T ^F	-200 °C to 400 °C	0.055 °C with 0° C RJ 0.20 °C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type E ^F	-200 °C to 1 000 °C	0.035 °C with 0° C RJ 0.19 °C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type K ^F	-200 °C to 1 300 °C	0.057 °C with 0° C RJ 0.20 °C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type N ^F	-200 °C to 1 300 °C	0.087 °C with 0° C RJ 0.21 °C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type C ^F	0 °C to 2 310 °C	0.11 °C with 0° C RJ 0.21 °C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type A ^F	0 °C to 2 500 °C	0.13 °C with 0° C RJ 0.20 °C with internal RJ	



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Temperature simulation use with Thermocouple Type PtPd ^F	0 °C to 1 500 °C	0.068 °C with 0 °C RJ 0.32 °C with internal RJ	Electrical measure of Thermocouple input Using Datron 1271 Euramet cg-11
Temperature Simulation use with Thermocouple Type AuPt ^F	0 °C to 1 000 °C	0.059 °C with 0° C RJ 0.32 °C with internal RJ	
Temperature Simulation use with Thermocouple Type R ^F	-50 °C to 1 768 °C	0.088 °C with 0° C RJ 0.40 °C with internal RJ	
Temperature Simulation use with Thermocouple Type S ^F	-50 °C to 1 768 °C	0.084 °C with 0° C RJ 0.40 °C with internal RJ	
Temperature Simulation use with Thermocouple Type B ^F	420 °C to 1 820 °C	0.084 °C with 0° C RJ 0.38 °C with internal RJ	
Temperature Simulation use with Thermocouple Type J ^F	-200 °C to 1 200 °C	0.018 °C with 0° C RJ 0.19 °C with internal RJ	
Temperature Simulation use with Thermocouple Type T ^F	-200 °C to 400 °C	0.024 °C with 0° C RJ 0.19 °C with internal RJ	
Temperature Simulation use with Thermocouple Type E ^F	-200 °C to 1 000 °C	0.016 °C with 0° C RJ 0.19 °C with internal RJ	
Temperature Simulation use with Thermocouple Type K ^F	-200 °C to 1 300 °C	0.025 °C with 0° C RJ 0.19 °C with internal RJ	
Temperature Simulation use with Thermocouple Type N ^F	-200 °C to 1 300 °C	0.037 °C with 0° C RJ 0.19 °C with internal RJ	
Temperature Simulation use with Thermocouple Type C ^F	0 °C to 2 310 °C	0.046 °C with 0° C RJ 0.19 °C with internal RJ	
Temperature Simulation use with Thermocouple Type A ^F	0 °C to 2 500 °C	0.054 °C with 0° C RJ 0.20 °C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with RTD ^F	-200 °C to 850 °C	0.055 °C	



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Temperature Simulation use with Resistance thermometer ^F	-200 °C to 850 °C	0.023 °C	Electrical measure of Resistance thermometer input Using Datron 1271 Euramet cg-11
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type Pt/Pd ^O	0 °C to 1 500 °C	0.44°C with 0 °C RJ 0.54°C with internal RJ	Electrical Simulation of Thermocouple Output Using MicroCal 20 DPC Euramet cg-11
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type Au/Pt ^O	0 °C to 1 000 °C	0.38°C with 0 °C RJ 0.49°C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type R ^O	-50 °C to 1 768 °C	0.56°C with 0 °C RJ 0.68°C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type S ^O	-50 °C to 1 768 °C	0.54°C with 0 °C RJ 0.66°C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type B ^O	420 °C to 1 820 °C	0.54°C with 0 °C RJ 0.65°C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type J ^O	-200 °C to 1 200 °C	0.15°C with 0 °C RJ 0.24°C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type T ^O	-200 °C to 400 °C	0.16°C with 0 °C RJ 0.24°C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type E ^O	-200 °C to 1 000 °C	0.13°C with 0 °C RJ 0.22°C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type K ^O	-200 °C to 1 300 °C	0.19°C with 0 °C RJ 0.27°C with internal RJ	



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Temperature Calibration, Indication and Control Equipment used with Thermocouple Type N ^o	-200 °C to 1 300 °C	0.24°C with 0 °C RJ 0.30°C with internal RJ	Electrical Simulation of Thermocouple Output Using MicroCal 20 DPC Euramet cg-11
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type C ^o	0 °C to 2 310 °C	0.53°C with 0 °C RJ 0.56°C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type A ^o	0 °C to 2 500 °C	0.59°C with 0 °C RJ 0.62°C with internal RJ	
Temperature Calibration, Indication and Control Equipment used with RTD ^o	-200 °C to 850 °C	0.17 °C	Electrical Simulation of Resistance thermometer Output Using MicroCal 20 DPC Euramet cg-11
Temperature simulation use with Thermocouple Type PtPd ^o	0 °C to 1 500 °C	0.82 °C with 0° C RJ 0.88 °C with internal RJ	Electrical measure of Thermocouple input Using Agilent 34970A Euramet cg-11
Temperature Simulation use with Thermocouple Type AuPt ^o	0 °C to 1 000 °C	0.72 °C with 0° C RJ 0.78 °C with internal RJ	
Temperature Simulation use with Thermocouple Type R ^o	-50 °C to 1 768 °C	1.1 °C with 0° C RJ 1.2 °C with internal RJ	
Temperature Simulation use with Thermocouple Type S ^o	-50 °C to 1 768 °C	1.1 °C with 0° C RJ 1.1 °C with internal RJ	
Temperature Simulation use with Thermocouple Type B ^o	420 °C to 1 820 °C	1.1 °C with 0° C RJ 1.1 °C with internal RJ	
Temperature Simulation use with Thermocouple Type J ^o	-200 °C to 1 200 °C	0.20 °C with 0° C RJ 0.27 °C with internal RJ	
Temperature Simulation use with Thermocouple Type T ^o	-200 °C to 400 °C	0.28 °C with 0° C RJ 0.34 °C with internal RJ	
Temperature Simulation use with Thermocouple Type E ^o	-200 °C to 1 000 °C	0.18 °C with 0° C RJ 0.26 °C with internal RJ	



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Temperature Simulation use with Thermocouple Type K ^o	-200 °C to 1300 °C	0.29 °C with 0° C RJ 0.34 °C with internal RJ	Electrical measure of Thermocouple input Using Agilent 34970A Euramet cg-11
Temperature Simulation use with Thermocouple Type N ^o	-200 °C to 1300 °C	0.44 °C with 0° C RJ 0.48 °C with internal RJ	
Temperature Simulation use with Thermocouple Type C ^o	0 °C to 2310 °C	0.51 °C with 0° C RJ 0.54 °C with internal RJ	
Temperature Simulation use with Thermocouple Type A ^o	0 °C to 2500 °C	0.60 °C with 0° C RJ 0.63 °C with internal RJ	
Temperature Simulation use with Resistance Thermometer ^o	-200 °C to 850 °C	0.17 °C	Electrical measure of Resistance thermometer input Using Agilent 34970A Euramet cg-11

Mechanical

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Absolute Pneumatic Pressure transducers, pressure transmitters, manometers ^F	0.14 kPa to 100 kPa	0.013 % of reading+ 1.8 Pa	Ruska 2465 EURAMET cg-17
In gas: Gage Pneumatic Pressure transducers, pressure transmitters, manometers ^F	0.14 kPa to 100 kPa	0.013 % of reading+ 1.5 Pa	
	100 kPa to 7 MPa	0.004 2 % of reading+ 11 Pa	
Gage Oil Pressure transducers, pressure transmitters, manometers ^F	40 kPa to 16 MPa	0.006 2 % of reading+ 61 Pa	Ruska 2400 EURAMET cg-17
	16 MPa to 83 MPa	0.004 7 % of the readings+ 73 Pa	
In gas: Gage Pneumatic Pressure transducers, pressure transmitters, manometers ^o	0.1 MPa to 7 Mpa	0.013 % of reading + 227 Pa	MicroCal 20 DPC EURAMET cg-17
Gage Oil Pressure transducers, pressure transmitters, manometers ^o	0.1 MPa to 7 MPa	0.012 % of the reading + 230 Pa	
	7 MPa to 35 MPa	0.015 % of the readings+ 1001 Pa	



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Thermodynamic

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Temperature measurement Thermocouple Pt/Pd ^F	0 °C to 150°C	0.24 °C	Additel 875-155 Additel 875-660 Nabertherm RD 30/200/13 SPRT Rosemount 162CE PRT Fluke 5628 Thermocouple Pt/Pd Datron 1271 ASTM E220 ASTM E2846
	150 °C to 420 °C	0.24 °C	
	420 °C to 600 °C	0.20 °C	
	600 °C to 1 050 °C	0.91 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Temperature measurement Thermocouple AuPt ^F	0 °C to 150°C	0.24 °C	
	150 °C to 420 °C	0.24 °C	
	420 °C to 600 °C	0.20 °C	
	600 °C to 1 050 °C	0.91 °C	
Temperature measurement Thermocouple R ^F	-40 °C to 150°C	0.33 °C	
	150 °C to 420 °C	0.23 °C	
	420 °C to 600 °C	0.20 °C	
	600 °C to 1 050 °C	0.91 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Temperature measurement Thermocouple S ^F	-40 °C to 150°C	0.33 °C	
	150 °C to 420 °C	0.24 °C	
	420 °C to 600 °C	0.20 °C	
	600 °C to 1 050 °C	0.91 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Temperature measurement Thermocouple B ^F	150 °C to 420 °C	0.31 °C	
	420 °C to 600 °C	0.20 °C	
	600 °C to 1 050 °C	0.91 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Temperature measurement Thermocouple J ^F	-40 °C to 150°C	0.15 °C	
	150 °C to 420 °C	0.24 °C	
	420 °C to 600 °C	0.24 °C	
	600 °C to 1 050 °C	1.3 °C	
	1 050 °C to 1 200 °C	1.6 °C	
Temperature measurement Thermocouple T ^F	-40 °C to 150°C	0.15 °C	
	150 °C to 400 °C	0.24 °C	
Temperature measurement Thermocouple E ^F	-40 °C to 150°C	0.15 °C	
	150 °C to 420 °C	0.24 °C	
	420 °C to 600 °C	0.24 °C	
	600 °C to 1 000 °C	1.3 °C	



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Strada San Faustino, 155 N, 41124, Modena (MO), Italy
 Dr. Giorgia Calzolari Phone: +39 059 3970648

Accreditation is granted to the facility to perform the following calibrations:

Thermodynamic

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Temperature measurement Thermocouple K ^F	-40 °C to 150 °C	0.15 °C	Additel 875-155
	150 °C to 420 °C	0.24 °C	Additel 875-660
	420 °C to 600 °C	0.24 °C	Nabertherm RD
	600 °C to 1 050 °C	1.3 °C	30/200/13
	1 050 °C to 1 300 °C	1.6 °C	SPRT Rosemount 162CE
Temperature measurement Thermocouple N ^F	- 40 °C to 150 °C	0.15 °C	PRT Fluke 5628
	150 °C to 420 °C	0.24 °C	Thermocouple Pt/Pd
	420 °C to 600 °C	0.24 °C	Datron 1271
	600 °C to 1 050 °C	1.3 °C	ASTM E220
	1 050 °C to 1 300 °C	1.6 °C	ASTM E2846
Temperature measurement Thermocouple C ^F	0 °C to 150 °C	0.15 °C	
	150 °C to 420 °C	0.24 °C	
	420 °C to 600 °C	0.24 °C	
	600 °C to 1 050 °C	1.3 °C	
	1 050 °C to 1 300 °C	1.6 °C	
Temperature measurement Thermocouple A ^F	0 °C to 150 °C	0.15 °C	
	150 °C to 420 °C	0.24 °C	
	420 °C to 600 °C	0.24 °C	
	600 °C to 1 050 °C	1.3 °C	
	1 050 °C to 1 300 °C	1.6 °C	
Temperature measurement Thermocouple Pt/Pd ^O	0 °C to 150 °C	0.79 °C	Additel 875-155
	150 °C to 420 °C	0.67 °C	Additel 875-660
	420 °C to 600 °C	0.47 °C	Nabertherm RD
	600 °C to 1 050 °C	0.96 °C	30/200/13
	1 050 °C to 1 300 °C	1.3 °C	SPRT Rosemount 162CE
Temperature measurement Thermocouple AuPt ^O	0 °C to 150 °C	0.70 °C	PRT Fluke 5628
	150 °C to 420 °C	0.67 °C	Thermocouple Pt/Pd
	420 °C to 600 °C	0.32 °C	Agilent 34970A
	600 °C to 1 050 °C	0.95 °C	ASTM E220



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Temperature measurement Thermocouple R °	-40 °C to 150°C	1.1 °C	Additel 875-155 Additel 875-660 Nabertherm RD 30/200/13 SPRT Rosemount 162CE PRT Fluke 5628 Thermocouple Pt/Pd Agilent 34970A ASTM E220 ASTM E2846
	150 °C to 420 °C	0.55 °C	
	420 °C to 600 °C	0.44 °C	
	600 °C to 1 050 °C	0.99 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Temperature measurement Thermocouple S °	-40 °C to 150°C	0.99 °C	
	150 °C to 420 °C	0.56 °C	
	420 °C to 600 °C	0.47 °C	
	600 °C to 1 050 °C	1.0 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Temperature measurement Thermocouple B °	150 °C to 420 °C	2.7 °C	
	420 °C to 600 °C	0.96 °C	
	600 °C to 1 050 °C	1.1 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Temperature measurement Thermocouple J °	-40 °C to 150°C	0.18 °C	
	150 °C to 420 °C	0.26 °C	
	420 °C to 600 °C	0.28 °C	
	600 °C to 1 050 °C	1.3 °C	
	1 050 °C to 1 200 °C	1.6 °C	
Temperature measurement Thermocouple T °	-40°C to 150°C	0.19 °C	
	150°C to 400°C	0.26 °C	
Temperature measurement Thermocouple E °	-40 °C to 150°C	0.17 °C	
	150 °C to 420 °C	0.26 °C	
	420 °C to 600 °C	0.27 °C	
	600 °C to 1 000 °C	1.3 °C	
Temperature measurement Thermocouple K °	-40 °C to 150°C	0.19 °C	
	150 °C to 420 °C	0.27 °C	
	420 °C to 600 °C	0.29 °C	
	600 °C to 1 050 °C	1.3 °C	
	1 050 °C to 1 300 °C	1.6 °C	



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Temperature measurement Thermocouple N ^o	-40 °C to 150°C	0.19 °C	Additel 875-155 Additel 875-660 Nabertherm RD 30/200/13 SPRT Rosemount 162CE PRT Fluke 5628 Thermocouple Pt/Pd Agilent 34970A ASTM E220 ASTM E2846
	150 °C to 420 °C	0.27 °C	
	420 °C to 600 °C	0.29 °C	
	600 °C to 1 050 °C	1.3 °C	
	1 050 °C to 1 300 °C	1.6 °C	
Temperature measurement Thermocouple C ^o	0 °C to 150°C	0.34 °C	
	150 °C to 420 °C	0.33 °C	
	420 °C to 600 °C	0.34 °C	
	600 °C to 1 050 °C	1.4 °C	
	1 050 °C to 1 300 °C	1.6 °C	
Temperature measurement Thermocouple A ^o	0 °C to 150°C	0.34 °C	
	150 °C to 420 °C	0.33 °C	
	420 °C to 600 °C	0.34 °C	
	600 °C to 1 050 °C	1.4 °C	
	1 050 °C to 1 300 °C	1.6 °C	
Temperature measurement RTD and thermistor ^F	-40°C to 150°C	0.044 °C	Additel 875-155 Additel 875-660 SPRT Rosemount 162CE PRT Fluke 5628 Datron 1271 ASTM E644 ASTM E2593
	150°C to 420°C	0.13 °C	
	420°C to 600°C	0.24 °C	



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Temperature measurement RTD and thermistor O	-40°C to 150°C	0.18 °C	Additel 875-155 Additel 875-660 SPRT Rosemount 162CE PRT Fluke 5628 Agilent 34970A ASTM E644 ASTM E2593
	150°C to 420°C	0.26 °C	
	420°C to 600°C	0.36 °C	
Digital thermometer used with Thermocouple PtPd ^F	0 °C to 150°C	0.25 °C	Additel 875-155 Additel 875-660 Nabertherm RD 30/200/13 SPRT Rosemount 162CE Fluke 5628 Thermocouple PtPd Datron 1271 ASTM E220 ASTM E2846
	150 °C to 420 °C	0.25 °C	
	420 °C to 600 °C	0.21 °C	
	600 °C to 1 050 °C	0.91 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Digital thermometer used with Thermocouple AuPt ^F	0 °C to 150°C	0.25 °C	
	150 °C to 420 °C	0.25 °C	
	420 °C to 600 °C	0.21 °C	
	600 °C to 1 050 °C	0.91 °C	
Digital thermometer used with Thermocouple R ^F	0 °C to 150°C	0.34 °C	
	150 °C to 420 °C	0.25 °C	
	420 °C to 600 °C	0.21 °C	
	600 °C to 1 050 °C	0.91 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Digital thermometer used with Thermocouple S ^F	0 °C to 150°C	0.34 °C	
	150 °C to 420 °C	0.25 °C	
	420 °C to 600 °C	0.21 °C	
	600 °C to 1 050 °C	0.91 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Digital thermometer used with Thermocouple B ^F	150 °C to 420 °C	0.25 °C	
	420 °C to 600 °C	0.21 °C	
	600 °C to 1 050 °C	0.91 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Digital thermometer used with Thermocouple J ^F	-40 °C to 150 °C	0.12 °C	
	150 °C to 420 °C	0.22 °C	
	420 °C to 600 °C	0.23 °C	
	600 °C to 1 050 °C	1.3 °C	
	1 050 °C to 1 200 °C	1.6 °C	
Digital thermometer used with Thermocouple T ^F	-40°C to 150°C	0.12 °C	
	150°C to 400°C	0.22 °C	



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Digital thermometer used with Thermocouple E ^F	-40 °C to 150 °C	0.12 °C	Additel 875-155 Additel 875-660 Nabertherm RD 30/200/13 SPRT Rosemount 162CE Fluke 5628 Thermocouple PtPd Datron 1271 ASTM E220 ASTM E2846
	150 °C to 420 °C	0.22 °C	
	420 °C to 600 °C	0.22 °C	
	600 °C to 1 000 °C	1.3 °C	
Digital thermometer used with Thermocouple K ^F	-40 °C to 150 °C	0.12 °C	
	150 °C to 420 °C	0.22 °C	
	420 °C to 600 °C	0.23 °C	
	600 °C to 1 050 °C	1.3 °C	
	1 050 °C to 1 300 °C	1.6 °C	
Digital thermometer used with Thermocouple N ^F	-40 °C to 150 °C	0.12 °C	
	150 °C to 420 °C	0.22 °C	
	420 °C to 600 °C	0.23 °C	
	600 °C to 1 050 °C	1.3 °C	
	1 050 °C to 1 300 °C	1.6 °C	
Digital thermometer used with Thermocouple C ^F	0 °C to 150 °C	0.11 °C	
	150 °C to 420 °C	0.21 °C	
	420 °C to 600 °C	0.22 °C	
	600 °C to 1 050 °C	1.3 °C	
	1 050 °C to 1 300 °C	1.6 °C	
Digital thermometer used with Thermocouple A ^F	0 °C to 150 °C	0.14 °C	
	150 °C to 420 °C	0.23 °C	
	420 °C to 600 °C	0.24 °C	
	600 °C to 1 050 °C	1.3 °C	
	1 050 °C to 1 300 °C	1.6 °C	



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Digital thermometer used with Thermocouple PtPd ⁰	0 °C to 150°C	0.29 °C	Additel 875-155 Additel 875-660 Nabertherm RD 30/200/13 SPRT Rosemount 162CE Fluke 5628 Thermocouple PtPd Agilent 34970A ASTM E220 ASTM E2846
	150 °C to 420 °C	0.29 °C	
	420 °C to 600 °C	0.29 °C	
	600 °C to 1 050 °C	0.94 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Digital thermometer used with Thermocouple AuPt ⁰	From 0 °C to 150°C	0.29 °C	
	150 °C to 420 °C	0.29 °C	
	420 °C to 600 °C	0.29 °C	
	600 °C to 1 000 °C	0.94 °C	
Digital thermometer used with Thermocouple R ⁰	-40°C to 150°C	0.36 °C	
	150°C to 420°C	0.29 °C	
	420°C to 600°C	0.29 °C	
	600°C to 1 050°C	0.94 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Digital thermometer used with Thermocouple S ⁰	-40°C to 150°C	0.36 °C	
	150°C to 420°C	0.29 °C	
	420°C to 600°C	0.29 °C	
	600°C to 1 050°C	0.94 °C	
	1 050 °C to 1 300 °C	1.3 °C	
Digital thermometer used with Thermocouple B ⁰	150°C to 420°C	0.29 °C	
	420°C to 600°C	0.29 °C	
	600°C to 1 050°C	0.94 °C	
	1 050 °C to 1 300 °C	1.3 °C	



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Digital thermometer used with Thermocouple J ^o	-40°C to 150°C	0.19 °C	Additel 875-155 Additel 875-660 Nabertherm RD 30/200/13 SPRT Rosemount 162CE Fluke 5628 Thermocouple PtPd Agilent 34970A ASTM E220 ASTM E2846
	150°C to 420°C	0.29 °C	
	420°C to 600°C	0.32 °C	
	600°C to 1 050°C	1.3 °C	
	1 050 °C to 1 200 °C	1.6 °C	
Digital thermometer used with Thermocouple T ^o	-40°C to 150°C	0.19 °C	
	150°C to 400°C	0.29 °C	
Digital thermometer used with Thermocouple E ^o	-40°C to 150°C	0.19 °C	
	150°C to 420°C	0.29 °C	
	420°C to 600°C	0.32 °C	
	600°C to 1 000°C	1.3 °C	
Digital thermometer used with Thermocouple K ^o	-40°C to 150°C	0.19 °C	
	150°C to 420°C	0.29 °C	
	420°C to 600°C	0.32 °C	
	600°C to 1 050°C	1.3 °C	
	1 050 °C to 1 300 °C	1.6 °C	
Digital thermometer used with Thermocouple N ^o	-40°C to 150°C	0.19 °C	
	150°C to 420°C	0.29 °C	
	420°C to 600°C	0.32 °C	
	600°C to 1 050°C	1.3 °C	
	1050 °C to 1 300 °C	1.6 °C	
Digital thermometer used with Thermocouple C ^o	0°C to 150°C	0.18 °C	
	150°C to 420°C	0.29 °C	
	420°C to 600°C	0.31 °C	
	600°C to 1 050°C	1.3 °C	
	1 050 °C to 1 300 °C	1.6 °C	
Digital thermometer used with Thermocouple A ^o	0°C to 150°C	0.20 °C	
	150°C to 420°C	0.30 °C	
	420°C to 600°C	0.33 °C	
	600°C to 1 050°C	1.3 °C	
	1 050 °C to 1 300 °C	1.6 °C	



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Digital thermometer used with RTD and thermistor ^F	-40°C to 150°C	0.043 °C	Additel 875-155
	150°C to 420°C	0.12 °C	Additel 875-660
	420°C to 600°C	0.24 °C	SPRT Rosemount 162CE PRT Fluke 5628 Datron 1271 ASTM E644 ASTM E2877
Digital thermometer used with RTD and thermistor ^O	-40°C to 150°C	0.14 °C	Additel 875-155
	150°C to 420°C	0.21 °C	Additel 875-660
	420°C to 600°C	0.31 °C	SPRT Rosemount 162CE PRT Fluke 5628 Agilent 34970A ASTM E644 ASTM E2877
Thermometer Infrared ^{FO}	150 °C to 420 °C	1.2 °C	IR-463 blackbody
	420 °C to 600 °C	1.4 °C	Thermocouple type S
	600 °C to 1 050 °C	2.3 °C	ASTM E1256 ASTM E2847
Temperature: Dew point hygrometer ^{FO}	-20°C to 40°C	0.21 °C	General Eastern HYGRO M2 General Eastern D2 General Eastern SIM-12H General Eastern C1 RH ASTM D4230
Temperature: measuring of temperature environmental conditions in air ^{FO}	10°C to 40°C	0.20 °C	Resistance thermometer General Eastern C1 RH Agilent 34970A CEM TH - 007
Temperature: controlled temperature enclosures ^O	-40°C to 150°C	0.45 °C	Resistance thermometer Agilent 34970A Euramet Calibration Guide N. 20 IEC 60068-3-11
Relative humidity: measuring of relative humidity environmental conditions in air ^{FO}	10% RH to 90% RH	1.5 % RH	General Eastern Hygro M2 General Eastern D2 General Eastern Sim 12H General Eastern C1 RH CEM TH - 007



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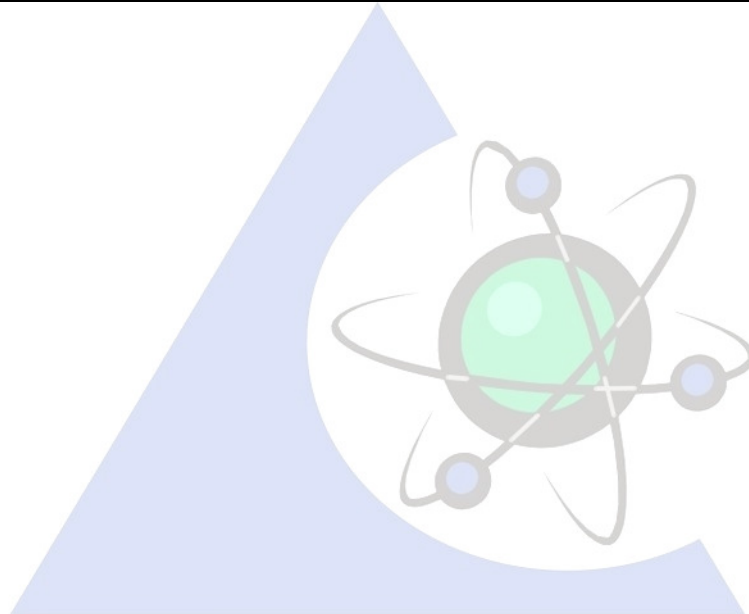
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Relative humidity: controlled humidity enclosures ⁰	10% RH to 90% RH	3.2 % RH	General Eastern Hygro M2 General Eastern D2 General Eastern Sim 12H Resistance thermometer Agilent 34970A Euramet Calibration Guide N. 20 IEC 60068-3-11





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Accreditation is granted to the facility to perform the following calibrations:

1. The CMC (Calibration and Measurement Capability) stated or calibrations included on this scope of accreditation represents the smallest measurement uncertainty attainable by the laboratory when performing a more or less routine calibration of a nearly ideal device under nearly ideal conditions. It is typically expressed at a confidence level of 95 % using a coverage factor k (usually equal to 2). The actual measurement uncertainty associated with a specific calibration performed by the laboratory will typically be larger than the CMC Or the same calibration since capability and performance of the device being calibrated and the conditions related to the calibration may reasonably be expected to deviate ideal to some degree.
2. The laboratories range of calibration capability or all disciplines or which they are accredited is the interval the smallest calibrated standard to the largest calibrated standard used in performing the calibration. The low end of this range must be an attainable value or which the laboratory has or has access to the standard referenced. Verification of an indicated value of zero in the absence of a standard is common practice in the procedure or many calibrations but by its definition it does not constitute calibration of zero capacity.
3. The presence of a superscript F means that the laboratory performs calibration of the indicated parameter at its fixed location. Example: Outside Micrometer^F would mean that the laboratory performs this calibration at its fixed location.
4. The presence of a superscript O means that the laboratory performs calibration of the indicated parameter onsite at customer locations. Example: Outside Micrometer^O would mean that the laboratory performs this calibration onsite at the customer's location.
5. The presence of a superscript FO means that the laboratory performs calibration of the indicated parameter both at its fixed location and onsite at customer locations. Example: Outside Micrometer^{FO} would mean that the laboratory performs this calibration at its fixed location and onsite at customer locations.
6. Measurement uncertainties obtained or calibrations performed at customer sites can be expected to be larger than the measurement uncertainties obtained at the laboratories fixed location or similar calibrations. This is due to the effects of transportation of the standards and equipment and upon environmental conditions at the customer site which are typically not controlled as closely as at the laboratories fixed location.



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7. The term D represents diameter in inches or millimeters as appropriate to the uncertainty statement.
8. The term DL represents diagonal length in inches or millimeters as appropriate to the uncertainty statement.

Note that Diameter and Diagonal both use the same designation "D". This is not a problem unless a laboratory is accredited or both however the usage is common and should be retained when possible and modified in the few cases where a laboratory is accredited or both. In those cases continue to use D Or diameter and use DL Or Diagonal Length. This note is intended or internal office use only and is to be removed during preparation of draft documents.

9. The term L represents length in inches or millimeters as appropriate to the uncertainty statement.
10. The term P represents pressure in units appropriate to the uncertainty statement.
11. The term R represents radius in inches or millimeters as appropriate to the uncertainty statement.
12. The term T represents temperature in °C or °F as appropriate to the uncertainty statement.
13. The term T represents torque in N•m (including SI multiple and submultiple units) Or the international system of units (the SI) or ozf•in, lbf•in and lbf•ft Or the USC system of units.

Note that temperature and torque both use the same designation "T". This is not a problem unless a laboratory is accredited or both however the usage is common and should be retained when possible and modified in the few cases where a laboratory is accredited or both. In those cases continue to use T Or temperature and use Tr Or torque. This note is intended or internal office use only and is to be removed during preparation of draft documents.

14. The term Wt represents weight in pounds or grams (including SI multiple and submultiple units) appropriate to the uncertainty statement.
15. The term "X" preceded by a number represents the number of times a lens system magnifies an image relative to its actual size. CMC stated as "% of magnification" represents the CMC of magnification expressed as a percentage of the total magnification.
16. The C represents concentration in moles or micromoles appropriate to the uncertainty statement.