

## 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, Modena (MO), 41124 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 for 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 for such testing and/or calibration services shall only be made from 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.

For PJLA:

Liacy Szensper

Tracy Szerszen President

Perry Johnson Laboratory Accreditation, Inc. (PJLA) 755 W. Big Beaver, Suite 1325 Troy, Michigan 48084 Initial Accreditation Date: May 08, 2020 Issue Date: June 06, 2024 *Expiration Date:* July 31, 2026

Accreditation No.: 108949

Certificate No.: L24-422

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: <u>www.pjlabs.com</u>



### AG METROLOGY S.r.l.

Strada San Faustino, 155 N, Modena (MO), 41124 Italy Contact Name: Sig.ra Giorgia Calzolari Phone: 335-705-4933

Electrical	-			
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Measure DC	Up to 1 mV	0.66 μV	Agilent 34420A	Euramet cg-15
Voltage <sup>r</sup>	1 mV to 10 mV	0.002 5 % of reading + 0.67 µV	Datron 12/1 Datron 4700	
	10 mV to 100 mV	0.001 3 % of reading + 0.98 $\mu$ V	Meatest M143	
	0.1 V to 1 V	0.001 3 % of reading + 2.0 $\mu$ V		
	1 V to 10 V	0.000 92 % of reading + 12 $\mu V$		
	10 V to 100 V	0.001 2 % of reading + 0.18 mV		
	100 V to 1 000 V	0.000 34 % of reading + 14 mV		
Equipment to Measure	Up to 100 µA	0.007 1 % of reading + 10 nA		
DC Current	0.1 µA to 1 mA	0.007 3 % of reading + 18 nA		
,	1 mA to 10 mA	0.007 3 % of reading + 0.14 µA		
	10 mA to 100 mA	0.015 % of reading + 1.4 μA		
	0.1 mA to 1 A	0.021 % of reading + 48 μA	7	
	1 A to 10 A	0.11 % of reading	/	
	10 A to 20 A	0.099 % of reading + 0.21 mA	6.	
Equipment to	Up to 1 Ω	0.008 0 % of reading + 8.9 μΩ	Agilent 34420A	
Measure Resistance <sup>F</sup>	1 $\Omega$ to 10 $\Omega$	0.007 5 % of reading + 15 $\mu\Omega$	Datron 1271	
Resistance	10 $\Omega$ to 100 $\Omega$	0.002 1 % of reading + 45 $\mu\Omega$	2724A	
	$0.1 \text{ k}\Omega$ to $1 \text{ k}\Omega$	$0.002~0~\%$ of reading + $0.67~m\Omega$		
	1 kΩ to 10 kΩ	0.002 0 % of reading + 5.6 m $\Omega$		
	10 k $\Omega$ to 100 k $\Omega$	0.002 2 % of reading + 0.38 $\Omega$		
	$0.1 \text{ M}\Omega$ to $1 \text{ M}\Omega$	0.003 4 % of reading + 0.45 $\Omega$		
	$1 \text{ M}\Omega$ to $10 \text{ M}\Omega$	0.005 3 % of reading + 0.19 k $\Omega$		
	$10 \text{ M}\Omega$ to $100 \text{ M}\Omega$	0.035 % of reading + 20 k $\Omega$		
	$0.1 \text{ G}\Omega$ to $1 \text{ G}\Omega$	0.40 % of reading + 1.9 M $\Omega$		
Equipment to Output	Up to 1 mV	0.24 μV	Agilent 34420A	CEM EL-010
DC Voltage <sup>r</sup>	1 mV to 10 mV	$0.003 4$ % of reading + 0.22 $\mu$ V	Datron 1271	
	10 mV to 100 mV	0.001 2 % of reading + 0.53 μV	1710KC 1 3020	
	0.1 V to 1 V	0.000 96 % of reading + 1.5 μV		
	1 V to 10 V	0.000 72 % of reading + 8.9 µV		
	10 V to 100 V	0.000 89 % of reading + 92 $\mu$ V		
	100 V to 1 000 V	0.000 23 % of reading + 11 mV		



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MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Output	Up to 100 µA	0.005 0 % of reading + 8.1 nA	Agilent 34420A	CEM EL-010
DC Current <sup>F</sup>	0.1 mA to 1 mA	0.005 7 % of reading + 12 nA	Datron 1271	
	1 mA to 10 mA	0.005 8 % of reading + 83 nA	Fluke 1 3020	
	10 mA to 100 mA	0.012 % of reading + 0.78 μA		
	0.1 A to 1 A	0.017 % of reading + 16 µA		
	1 A to 10 A	0.006 0 % of reading + 24 µA		
	1 A to 20 A	0.006 5 % of reading		
Equipment to	Up to 1 Ω	$0.0064\%$ of reading + 6.3 $\mu\Omega$	Agilent 34420A	
Output Registered F	$1 \Omega$ to $10 \Omega$	0.005 9 % of reading + 12 $\mu\Omega$	Datron 1271	
Resistance	$10 \Omega$ to $100 \Omega$	0.001 5 % of reading + 23 $\mu\Omega$		
	$0.1 \text{ k}\Omega$ to $1 \text{ k}\Omega$	$0.0014$ % of reading + $0.45$ m $\Omega$		
	1 kΩ to 10 kΩ	$0.0014$ % of reading + 3.4 m $\Omega$		
	$10 \text{ k}\Omega$ to $100 \text{ k}\Omega$	0.001 6 % of reading + 0.16 $\Omega$	)	
	$0.1 \text{ M}\Omega$ to $1 \text{ M}\Omega$	0.002 7 % of reading		
	1 MΩ to 10 MΩ	0.004 9 % of reading + 62 $\Omega$		
	10 MΩ to 100 MΩ	$0.035$ % of reading + 7.6 k $\Omega$		
	$0.1 \text{ G}\Omega$ to $1 \text{ G}\Omega$	$0.39$ % of reading + 0.72 M $\Omega$		
Equipment to Measure	Up to 100 mV	0.011 % of reading + 7.1 $\mu$ V	Agilent 34420A	Euramet cg-15
DC Voltage	0.1 V to 1 V	0.006 1 % of reading + 11 μV	Datron 1271	
	1 V to 10 V	0.006 1 % of reading + 51 μV	Wiealest W1145	
	10 V to 100 V	0.006 1 % of reading + 1.1 mV		
	100 V to 1000 V	0.011 % of reading + 21 mV		
Equipment to Measure	Up to 200 µA	0.051 % of reading + 22 nA		
DC Current <sup>0</sup>	0.2 to 2 mA	0.026 % of reading + 0.13 µA		
	2 to 20 mA	0.019 % of reading + 1.5 μA		
	20 to 200 mA	0.022 % of reading + 25 µA		
	0.2 to 2 A	0.016 % of reading + 0.16 mA		
	2 to 20 A	0.11 % of reading + 2.1 mA		



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Equipment to	Up to 10 Ω	$0.0045\%$ of reading $+0.41$ m $\Omega$	Agilent 34420A	Euramet cg-15
Measure DC Resistance <sup>0</sup>	10 to 100 Ω	$0.003 \ 2 \ \% \text{ of reading} + 4.1 \ \text{m}\Omega$	Datron 1271	
	0.1 to 1 kΩ	$0.002 4$ % of reading + 41 m $\Omega$	Valhalla Scientific	
	1 to 10 kΩ	0.002 7 % of reading + 0.41 Ω	2724A	
	10 to 100 kΩ	0.002 6 % of reading + 4.1 Ω		
	1 MΩ	56 Ω		
	10 MΩ	1.3 kΩ		
	100 MΩ	81 kΩ		
Equipment to Output DC	Up to 100 mV	0.005 2 % of reading + 3.8 μV	Agilent 34420A	CEM EL-10
Voltage <sup>0</sup>	0.1 V to 1 V	0.004 2 % of reading + 7.4 μV	Datron 1271	
	1 V to 10 V	0.003 6 % of reading + 52 µV	Fluke Y 5020	
	10 V to 100 V	0.004 7 % of reading + 0.64 mV		
	100 V to 1 000 V	0.004 7 % of reading + 11 mV	)	
Equipment to Output DC	Up to 100 µA	0.007 3 % of reading + 2.8 nA		
Current <sup>0</sup>	0.1 mA to 1 mA	0.007 3 % of reading + 20 nA		
	1 mA to 10 mA	0.051 % of reading + 2.1 $\mu$ A		
	10 mA to 100 mA	0.052 % of reading + 5.5 μA		
	0.1 A to 1 A	0.11 % of reading + 0.12 mA		
	1 A to 20 A	0.046 % of reading + 3.6 mA		
Equipment to Output DC	Up to 100 Ω	$0.012$ % of reading + 4.1 m $\Omega$		
Resistance <sup>0</sup>	0.1 to 1 kΩ	0.011 % of reading + 12 m $\Omega$		
	1 to 10 kΩ	0.011 % of reading + 0.12 $\Omega$		
	10 to 100 kΩ	$0.011$ % of reading + 1.2 $\Omega$		
	0.1 to 1 MΩ	0.011 % of reading + 12 $\Omega$		
	1 to 10 MΩ	$0.041$ % of reading + $0.23$ k $\Omega$		
	10 to 100 MΩ	$0.81$ % of reading + 11 k $\Omega$		
Equipment to Measure AC At the Listed Frequencies	Voltage		Datron 1271 Datron 4700	Euramet cg-15
40 Hz to 2 kHz	Up to 100 mV	$0.034$ % of reading + 18 $\mu$ V		
2 kHz to 20 kHz	Up to 100 mV	$0.046$ % of reading + 27 $\mu$ V	]	
20 kHz to 100 kHz	Up to 100 mV	0.18 % of reading + 46 $\mu$ V		



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Equipment to Measure AC	Voltage At the Listed Fre	equencies <sup>F</sup>	Datron 1271	Euramet cg-15
40 Hz to 2 kHz	0.1 V to 1 V	0.029 % of reading + 0.11 mV	Datron 4700	
2 kHz to 20 kHz	0.1 V to 1 V	0.030 % of reading + 0.11 mV		
20 kHz to 100 kHz	0.1 V to 1 V	0.12 % of reading + 0.41 mV		
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 Fre	equencies <sup>F</sup>		
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 + 0.21 V		
300 kHz to 1 MHz	1 V to 10 V	2.1 % of reading + 0.41 V		
Equipment to Measure AC	Voltage At the Listed Fre	equencies <sup>F</sup>	)	
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 Fre	equencies <sup>F</sup>		
40 Hz to 2 kHz	100 V to 1 000 V	0.037 % of reading + 0.16 V		
2 kHz to 20 kHz	100 V to 1 000 V	0.035 % of reading + 0.25 V		
20 kHz to 100 kHz	100 V to 1 000 V	0.17 % of reading + 0.45 V		
Equipment to Output AC V	Voltage At the Listed Freq	uencies <sup>F</sup>	Datron 1271	CEM EL-010
40 Hz to 2 kHz	Up to 100 mV	$0.026$ % of reading + 15 $\mu$ V		
2 kHz to 20 kHz	Up to 100 mV	0.041 % of reading + 13 $\mu$ V		
20 kHz to 100 kHz	Up to 100 mV	0.17 % of reading + 45 $\mu$ V		
Equipment to Output AC V	oltage At the Listed Frequ	iencies <sup>F</sup>		
40 Hz to 2 kHz	0.1 V to 1 V	0.021 % of reading + 0.11 mV		
2 kHz to 20 kHz	0.1 V to 1 V	$0.030$ % of reading + 53 $\mu$ V		
20 kHz to 100 kHz	0.1 V to 1 V	0.11 % of reading + 0.41 mV		
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 V	oltage At the Listed Frequ	iencies <sup>F</sup>	Datron 1271	CEM EL-010
40 Hz to 2 kHz	1 V to 10 V	0.021 % of reading + 1.1 mV		
2 kHz to 20 kHz	1 V to 10 V	0.021 % of reading + 0.51 mV		
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 + 0.11 V	-	
300 kHz to 1 MHz	1 V to 10 V	2.1 % of reading + 0.41 V	-	
Equipment to Output AC V	oltage At the Listed Frequ	iencies <sup>F</sup>	-	
40 Hz to 2 kHz	10 V to 100 V	0.021 % of reading + 11 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 V	Voltage At the Listed Frequ	iencies <sup>F</sup>		
40 Hz to 2 kHz	100 V to 1 000 V	0.026 % of reading + 0.15 V		
2 kHz to 20 kHz	100 V to 1 000 V	0.031 % of reading + 0.13 V	7	
20 kHz to 100 kHz	100 V to 1 000 V	0.17 % of reading + 0.45 V		
Equipment to Measure AC Current At the Listed Frequencies F			Datron 1271	Euramet cg-15
Equipment to measure me	Current It the Eisted I fe	1		Editamet og 15
10 Hz to 5 kHz	Up to 100 µA	0.069 % of reading + 33 nA	Datron 4700	
10 Hz to 5 kHz 10 Hz to 5 kHz	Up to 100 μA         0.1 mA to 1 mA	0.069 % of reading + 33 nA 0.048 % of reading + 0.30 μA	Datron 4700 Meatest M143	Dorallee eg 10
10 Hz to 5 kHz10 Hz to 5 kHz10 Hz to 5 kHz10 Hz to 5 kHz	Up to 100 μA         0.1 mA to 1 mA         1 mA to 10 mA	0.069 % of reading + 33 nA         0.048 % of reading + 0.30 μA         0.048 % of reading + 2.7 μA	Datron 4700 Meatest M143	
10 Hz to 5 kHz	Up to 100 μA         0.1 mA to 1 mA         1 mA to 10 mA         10 mA to 100 mA	0.069 % of reading + 33 nA         0.048 % of reading + 0.30 μA         0.048 % of reading + 2.7 μA         0.048 % of reading + 2.7 μA	Datron 4700 Meatest M143	
10 Hz to 5 kHz	Up to 100 μA         0.1 mA to 1 mA         1 mA to 10 mA         10 mA to 100 mA         0.1 A to 1 A	0.069 % of reading + 33 nA         0.048 % of reading + 0.30 μA         0.048 % of reading + 2.7 μA         0.048 % of reading + 2.7 μA         0.048 % of reading + 2.4 μA         0.17 % of reading + 0.84 mA	Datron 4700 Meatest M143	
10 Hz to 5 kHz	Up to 100 μA       Distoit 1 fee         0.1 mA to 1 mA       1         1 mA to 10 mA       10 mA to 100 mA         0.1 A to 1 A       1	$\begin{array}{c} 0.069 \ \% \ of \ reading + 33 \ nA \\ 0.048 \ \% \ of \ reading + 0.30 \ \mu A \\ 0.048 \ \% \ of \ reading + 2.7 \ \mu A \\ 0.048 \ \% \ of \ reading + 27 \ \mu A \\ 0.17 \ \% \ of \ reading + 0.84 \ mA \\ 0.36 \ \% \ of \ reading + 15 \ mA \end{array}$	Datron 4700 Meatest M143	
10 Hz to 5 kHz 10 Hz to 5 kHz Equipment to Output AC C	Up to 100 µA 0.1 mA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 0.1 A to 1 A 1 A to 20 A Current At the Listed Frequ	$\begin{array}{c} 0.069 \ \% \ of \ reading + 33 \ nA \\ 0.048 \ \% \ of \ reading + 0.30 \ \mu A \\ 0.048 \ \% \ of \ reading + 2.7 \ \mu A \\ 0.048 \ \% \ of \ reading + 27 \ \mu A \\ 0.17 \ \% \ of \ reading + 0.84 \ mA \\ 0.36 \ \% \ of \ reading + 15 \ mA \\ \end{array}$	Datron 4700 Meatest M143 Datron 1271	CEM EL-010
10 Hz to 5 kHz 10 Hz to 5 kHz Equipment to Output AC C 10 Hz to 5 kHz	Up to 100 μA 0.1 mA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 0.1 A to 1 A 1 A to 20 A Current At the Listed Frequ Up to 100 μA	$\begin{array}{c} 0.069 \% \text{ of reading + 33 nA} \\ 0.048 \% \text{ of reading + 0.30 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 27 } \mu\text{A} \\ 0.17 \% \text{ of reading + 0.84 mA} \\ 0.36 \% \text{ of reading + 15 mA} \\ \end{array}$	Datron 4700 Meatest M143 Datron 1271 Fluke Y5020	CEM EL-010
10 Hz to 5 kHz10 Hz to 5 kHz	Up to 100 μA         0.1 mA to 1 mA         1 mA to 10 mA         10 mA to 100 mA         0.1 A to 1 A         1 A to 20 A         Current At the Listed Frequ         Up to 100 μA         0.1 mA to 1 mA	$\begin{array}{c} 0.069 \% \text{ of reading + 33 nA} \\ 0.048 \% \text{ of reading + 0.30 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.17 \% \text{ of reading + 0.84 mA} \\ 0.36 \% \text{ of reading + 15 mA} \\ \hline \text{nencies } ^{\text{F}} \\ \hline 0.041 \% \text{ of reading + 33 nA} \\ 0.032 \% \text{ of reading + 0.24 } \mu\text{A} \end{array}$	Datron 4700 Meatest M143 Datron 1271 Fluke Y5020	CEM EL-010
10 Hz to 5 kHz10 Hz to 5 kHz	Up to 100 µA 0.1 mA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 0.1 A to 1 A 1 A to 20 A Current At the Listed Frequ Up to 100 µA 0.1 mA to 1 mA 1 mA to 10 mA	$\begin{array}{c} 0.069 \% \text{ of reading + 33 nA} \\ 0.048 \% \text{ of reading + 0.30 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 27 } \mu\text{A} \\ 0.17 \% \text{ of reading + 0.84 mA} \\ 0.36 \% \text{ of reading + 15 mA} \\ \hline \text{encies }^{\text{F}} \\ \hline 0.041 \% \text{ of reading + 33 nA} \\ 0.032 \% \text{ of reading + 0.24 } \mu\text{A} \\ \hline 0.032 \% \text{ of reading + 2.2 } \mu\text{A} \\ \hline \end{array}$	Datron 4700 Meatest M143 Datron 1271 Fluke Y5020	CEM EL-010
10 Hz to 5 kHz	Up to 100 μA         0.1 mA to 1 mA         1 mA to 10 mA         10 mA to 100 mA         0.1 A to 1 A         1 A to 20 A         Current At the Listed Frequ         Up to 100 μA         0.1 mA to 1 mA	$\begin{array}{c} 0.069 \% \text{ of reading + 33 nA} \\ 0.048 \% \text{ of reading + 0.30 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.17 \% \text{ of reading + 0.84 mA} \\ 0.36 \% \text{ of reading + 15 mA} \\ \hline \text{nencies } ^{\text{F}} \\ \hline 0.041 \% \text{ of reading + 33 nA} \\ 0.032 \% \text{ of reading + 0.24 } \mu\text{A} \\ 0.032 \% \text{ of reading + 2.2 } \mu\text{A} \\ \hline 0.032 \% \text{ of reading + 2.1 } \mu\text{A} \\ \hline \end{array}$	Datron 4700 Meatest M143 Datron 1271 Fluke Y5020	CEM EL-010
10 Hz to 5 kHz10 Hz to 5 kHz	Up to 100 μA         0.1 mA to 1 mA         1 mA to 10 mA         10 mA to 100 mA         0.1 A to 1 A         1 A to 20 A         Current At the Listed Frequ         Up to 100 μA         0.1 mA to 1 mA         1 mA to 10 mA         0.1 A to 1 A         1 A to 20 A         Current At the Listed Frequ         Up to 100 μA         0.1 mA to 1 mA         1 mA to 10 mA         10 mA to 100 mA         0.1 A to 1 A	$\begin{array}{c} 0.069 \% \text{ of reading + 33 nA} \\ 0.048 \% \text{ of reading + 0.30 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 27 } \mu\text{A} \\ 0.17 \% \text{ of reading + 0.84 mA} \\ 0.36 \% \text{ of reading + 15 mA} \\ \hline \text{nencies }^{\text{F}} \\ \hline 0.041 \% \text{ of reading + 33 nA} \\ 0.032 \% \text{ of reading + 0.24 } \mu\text{A} \\ 0.032 \% \text{ of reading + 2.2 } \mu\text{A} \\ \hline 0.032 \% \text{ of reading + 2.1 } \mu\text{A} \\ \hline 0.16 \% \text{ of reading + 0.81 mA} \\ \end{array}$	Datron 4700 Meatest M143 Datron 1271 Fluke Y5020	CEM EL-010
10 Hz to 5 kHz       10 Hz to 5 kHz	Up to 100 $\mu$ A       0.1 mA to 1 mA       1 mA to 10 mA       10 mA to 100 mA       0.1 A to 1 A       1 A to 20 A       Current At the Listed Frequ       Up to 100 $\mu$ A       0.1 mA to 1 mA       1 n to 100 $\mu$ A       0.1 mA to 1 mA       1 n to 10 mA       1 n to 10 mA       1 n A to 20 A	$\begin{array}{c} 0.069 \% \text{ of reading + 33 nA} \\ 0.048 \% \text{ of reading + 0.30 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.17 \% \text{ of reading + 0.84 mA} \\ 0.36 \% \text{ of reading + 0.84 mA} \\ 0.36 \% \text{ of reading + 15 mA} \\ \hline \text{nencies } ^{\text{F}} \\ \hline 0.041 \% \text{ of reading + 33 nA} \\ 0.032 \% \text{ of reading + 0.24 } \mu\text{A} \\ 0.032 \% \text{ of reading + 2.2 } \mu\text{A} \\ 0.032 \% \text{ of reading + 2.1 } \mu\text{A} \\ 0.16 \% \text{ of reading + 0.81 mA} \\ 0.023 \% \text{ of reading + 1.3 mA} \\ \hline \end{array}$	Datron 4700 Meatest M143 Datron 1271 Fluke Y5020	CEM EL-010
10 Hz to 5 kHz10 Hz to 5 kHz	Up to 100 μA         0.1 mA to 1 mA         1 mA to 10 mA         10 mA to 100 mA         0.1 A to 1 A         1 A to 20 A         Current At the Listed Frequence         Up to 100 μA         0.1 mA to 1 mA         1 mA to 10 mA         0.1 A to 1 A         1 A to 20 A         Current At the Listed Frequence         Up to 100 μA         0.1 mA to 1 mA         1 mA to 10 mA         10 mA to 100 mA         0.1 A to 1 A         1 A to 20 A         Voltage At the Listed Frequence	$\begin{array}{c} 0.069 \% \text{ of reading + 33 nA} \\ 0.048 \% \text{ of reading + 0.30 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 27 } \mu\text{A} \\ 0.17 \% \text{ of reading + 0.84 mA} \\ 0.36 \% \text{ of reading + 15 mA} \\ \hline \text{nencies }^{\text{F}} \\ \hline 0.041 \% \text{ of reading + 15 mA} \\ \hline 0.032 \% \text{ of reading + 0.24 } \mu\text{A} \\ 0.032 \% \text{ of reading + 2.2 } \mu\text{A} \\ \hline 0.032 \% \text{ of reading + 2.1 } \mu\text{A} \\ \hline 0.16 \% \text{ of reading + 0.81 mA} \\ \hline 0.023 \% \text{ of reading + 1.3 mA} \\ \hline \text{quencies }^{\text{O}} \end{array}$	Datron 4700 Meatest M143 Datron 1271 Fluke Y5020 Datron 1271	CEM EL-010 Euramet cg-15
10 Hz to 5 kHz10 Hz to 5 kHz	Up to $100 \mu A$ 0.1  mA to  1  mA 1  mA to  10  mA 1  mA to  10  mA 10  mA to  100  mA 0.1  A to  1  A 1  A to  20  A Current At the Listed Frequ Up to $100 \mu A$ 0.1  mA to  1  mA 1  mA to  10  mA 10  mA to  100  mA 10  mA to  100  mA 10  mA to  100  mA 10  to  1  A 1  A to  20  A Voltage At the Listed Free Up to $100 \text{ mV}$	$\begin{array}{c} 0.069 \% \text{ of reading + 33 nA} \\ 0.048 \% \text{ of reading + 0.30 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.048 \% \text{ of reading + 2.7 } \mu\text{A} \\ 0.17 \% \text{ of reading + 27 } \mu\text{A} \\ 0.36 \% \text{ of reading + 0.84 mA} \\ 0.36 \% \text{ of reading + 15 mA} \\ \hline \text{tencies } ^{\text{F}} \\ \hline 0.041 \% \text{ of reading + 33 nA} \\ 0.032 \% \text{ of reading + 0.24 } \mu\text{A} \\ 0.032 \% \text{ of reading + 2.2 } \mu\text{A} \\ 0.032 \% \text{ of reading + 2.1 } \mu\text{A} \\ \hline 0.16 \% \text{ of reading + 0.81 mA} \\ \hline 0.023 \% \text{ of reading + 1.3 mA} \\ \hline \text{quencies } ^{\text{O}} \\ \hline 0.11 \% \text{ of reading + 0.053 mV} \end{array}$	Datron 4700 Meatest M143 Datron 1271 Fluke Y5020 Datron 1271 Meatest M143	CEM EL-010 Euramet cg-15



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#### Accreditation is granted to the facility to perform the following Calibration:

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Measure AC	Voltage At the Listed Free	quencies <sup>O</sup>	Datron 1271	Euramet cg-15
40 Hz to 400 Hz	0.1 V to 1 V	0.055 % of reading + 0.13 mV	Meatest M143	
400 Hz to 10 kHz	0.1 V to 1 V	0.077 % of reading + 0.12 mV		
Equipment to Measure AC	Voltage At the Listed Free	quencies <sup>o</sup>		
40 Hz to 400 Hz	1 V to 10 V	0.055 % of reading + 1.3 mV		
400 Hz to 10 kHz	1 V to 10 V	0.074 % of reading + 3.1 mV		
Equipment to Measure AC	Voltage At the Listed Free	quencies <sup>O</sup>		
40 Hz to 400 Hz	10 V to 100 V	0.055 % of reading + 0.015 V		
400 Hz to 10 kHz	10 V to 100 V	0.074 % of reading + 0.031 V		
Equipment to Measure AC	Voltage At the Listed Free	quencies <sup>O</sup>		
40 Hz to 400 Hz	100 V to 1000 V	0.075 % of reading + 0.26 V		
400 Hz to 10 kHz	100 V to 1000 V	0.11 % of reading + 0.33 V		
Equipment to Measure AC	Current At the Listed Free	quencies <sup>O</sup>	/	
20 Hz to 200 Hz	Up to 200 μA	0.26 % of reading + 0.25 μA	6.1	
200 Hz to 1 kHz	Up to 200 µA	0.21 % of reading + 0.32 μA		
Equipment to Measure AC	Current At the Listed Free	quencies <sup>0</sup>		
20 Hz to 200 Hz	0.2 mA to 2 mA	0.11 % of reading + 2.3 μA		
200 Hz to 1 kHz	0.2 mA to 2 mA	0.11 % of reading + 2.3 μA		
Equipment to Measure AC	Current At the Listed Free	luencies <sup>0</sup>		
20 Hz to 200 Hz	2 mA to 20 mA	0.077 % of reading + 22 μA		
200 Hz to 1 kHz	2 mA to 20 mA	0.11 % of reading + 22 μA		
Equipment to Measure AC	Current At the Listed Free	luencies <sup>O</sup>		
20 Hz to 200 Hz	20 mA to 200 mA	0.18 % of reading + 0.82 mA		
200 Hz to 1 kHz	20 mA to 200 mA	0.19 % of reading + 0.82 mA		
Equipment to Measure AC	Current At the Listed Free	quencies <sup>O</sup>		
20 Hz to 200 Hz	0.2 A to 2 A	0.11 % of reading + 1.4 mA		
200 Hz to 1 kHz	0.2 A to 2 A	0.16 % of reading + 1.7 mA		
Equipment to Measure AC	Current At the Listed Free	quencies <sup>O</sup>		
20 Hz to 200 Hz	2 A to 20 A	0.26 % of reading + 3.3 mA	]	
200 Hz to 1 kHz	2 A to 20 A	$0.21 \frac{1}{\%}$ of reading + 11 mA		
Equipment to Output AC V	oltage At the Listed Frequ	iencies <sup>0</sup>	Datron 1271	CEM EL-010
40 Hz to 2 kHz	Up to 100 mV	0.069 % of reading + 44 $\mu$ V	Agilent 34401A	
2 kHz to 20 kHz	Up to 100 mV	$0.076$ % of reading + 49 $\mu$ V		
20 kHz to 100 kHz	Up to 100 mV	$0.63 \frac{1}{\%}$ of reading + 93 $\mu$ V		

Issue: 06/2024

*This supplement is in conjunction with certificate* #L24-422



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Electrical	C		C	
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Equipment to Output AC Vo	ltage At the Listed Freq	uencies <sup>O</sup>	Datron 1271	CEM EL-010
40 Hz to 2 kHz	0.1 V to 1 V	0.067 % of reading + 0.32 mV	Agilent 34401A	
2 kHz to 20 kHz	0.1 V to 1 V	0.070 % of reading + 0.32 mV	Fluke 1 3020	
20 kHz to 100 kHz	0.1 V to 1 V	0.62 % of reading + 0.90 mV		
100 kHz to 300 kHz	0.1 V to 1 V	1.9 % of reading + 24 mV		
Equipment to Output AC Vo	ltage At the Listed Freq	uencies <sup>O</sup>		
40 Hz to 2 kHz	1 V to 10 V	0.067 % of reading + 3.2 mV		
2 kHz to 20 kHz	1 V to 10 V	0.067 % of reading + 3.2 mV		
20 kHz to 100 kHz	1 V to 10 V	0.62 % of reading + 9.0 mV		
100 kHz to 300 kHz	1 V to 10 V	1.5 % of reading + 0.24 V		
Equipment to Output AC Vo	Itage At the Listed Freq	uencies <sup>0</sup>		
40 Hz to 2 kHz	10 V to 100 V	0.066 % of reading + 32 mV		
2 kHz to 20 kHz	10 V to 100 V	0.066 % of reading + 32 mV	)	
20 kHz to 100 kHz	10 V to 100 V	0.62 % of reading + 90 mV		
Equipment to Output AC Vo	Itage At the Listed Freq	uencies <sup>0</sup>		
40 Hz to 2 kHz	100 V to 750 V	0.071 % of reading + 0.28 V		
2 kHz to 20 kHz	100 V to 750 V	0.070 % of reading + 0.34 V		
20 kHz to 100 kHz	100 V to 750 V	0.63 % of reading + 0.76 V		
Equipment to Output AC Cu	rrent At the Listed Frequ	iencies <sup>0</sup>		
10 Hz to 5 kHz	Up to 1 A	0.20 % of reading + 0.94 mA		
Equipment to Output AC Vo	ltage At the Listed Freq	uencies <sup>0</sup>		
10 Hz to 5 kHz	1 A to 20 A	0.030 % of reading + 1.6 mA		
DC Clamp meter <sup>FO</sup>	20 A to 500 A	0.40 % of reading + 18 mA	Datron 1271	CEM EL-007
	500 A to 1 000 A	0.38 % of reading + 0.10 A	Meatest M143	
AC Clamp meter At the Liste	ed Frequencies <sup>FO</sup>		Weatest 140-50 COII	
10 Hz to100 Hz	20 A to 500 A	0.44 % of reading + 23 mA		
10 Hz to 100 Hz	500 A to 1 000 A	0.44 % of reading		
Temperature Calibration, Indication and Control Equipment used with Thermocouple Type Pt/Pd <sup>F</sup>	0 °C to 1 500 °C With 0 °C RJ With internal RJ	0.080 °C - 0.003 1 % of reading 0.28 °C	Agilent 34420A Datron 1271 Datron 4700	Euramet cg-11
r nermocoupie Type PVPa	1			



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Electrical	-		-	
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE A DEPORDUATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Calibration	$0 \circ C$ to $1 000 \circ C$	$0.070 ^{\circ}\text{C} = 0.004 ^{\circ}0\%$ of reading	Agilent 34420 A	Furamet.cg_11
Indication and Control	With 0 °C RI	0.28 °C	Datron 1271	Euramet eg-11
Equipment used with	With internal R I	0.20 C	Datron 4700	
Thermocouple Type $Au/Pt^{F}$			Dation 4700	
Temperature Calibration	-50 °C to 1 768 °C	0.11 °C - 0.002.2 % of reading		
Indication and Control	With 0 °C RI	$0.18 ^{\circ}\text{C} = 0.001 ^{7}\text{W}$ of reading		
Equipment used with	With internal RI	0.18 C - 0.001 / /0 01 reading		
Thermocouple Type P <sup>F</sup>				
Temperature Calibration	-50 °C to 1 768 °C	0.11 °C = 0.001.6 % of reading		
Indication and Control	With 0 °C RI	0.17 °C		
Equipment used with	With internal RI	0.17 0		
Thermocouple Type S <sup>F</sup>				
Temperature Calibration	420 °C to 1 820 °C	$0.11 \circ C = 0.002 3 \%$ of reading		
Indication and Control	With 0 °C R I	$0.41 ^{\circ}\text{C} - 0.002.6 ^{\circ}\text{M}$ of reading		
Equipment used with	With internal R I	0.41 C 0.005 0 /0 01 reading		
Thermocouple Type B <sup>F</sup>				
Temperature Calibration	200 °C to 1 200 °C	0.028 °C		
Indication and Control	-200 C to 1 200 C With 0 °C R I	0.028 C		
Equipment used with	With internal R I	0.14 C		
Thermocouple Type I <sup>F</sup>				
Temperature Calibration	200 °C to 400 °C	0.029 °C 0.003 3 % of reading		
Indication and Control	With 0 °C RI	$0.13 ^{\circ}\text{C}$ = 0.008 3 % of reading		
Equipment used with	With internal R I	0.15 C - 0.008 5 /0 01 reading		
Thermocouple Type T <sup>F</sup>	with internal res			
Temperature Calibration	200 °C to 1 000 °C	0.026 °C		
Indication and Control	With 0 °C RI	0.14 °C		
Equipment used with	With internal R I	0.14 C		
Thermocouple Type F <sup>F</sup>				
Temperature Calibration	-200 °C to 1 300 °C	0.037 °C		
Indication and Control	With 0 °C RI	0.14 °C		
Equipment used with	With internal R I	0.14 C		
Thermocouple Type K <sup>F</sup>				
Temperature Calibration	-200 °C to 1 300 °C	0.049 °C - 0.001 3 % of reading		
Indication and Control	With 0 °C RI	0.14 °C		
Fauinment used with	With internal RI	0.17 0		
Thermocouple Type N <sup>F</sup>				
Temperature Calibration	0 °C to 2 310 °C	$0.033 \circ C + 0.003 8 \%$ of reading		
Indication and Control	With 0 °C RI	0.005 C + 0.005 8 / 0.011 cading 0.20 °C + 0.001 3 % of reading		
Equipment used with	With internal RI	0.20 C + 0.001 5 70 01 reading		
Thermocouple Type C <sup>F</sup>				
i normotoupie i ype C				1



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Electrical				
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Calibration,	0 °C to 2 500 °C	0.037 °C + 0.004 1 % of reading	Agilent 34420A	Euramet cg-11
Indication and Control	With 0 °C RJ	0.20 °C + 0.003 2 % of reading	Datron 1271	
Equipment used with	With internal RJ		Datron 4700	
Thermocouple Type A <sup>F</sup>				
Temperature simulation use	0 °C to 1 500 °C	0.027 °C	Agilent 34420A	
with Thermocouple Type	With 0 °C RJ	0.27	Datron 1271	
PtPd <sup>F</sup>	With internal RJ			
Temperature Simulation	0 °C to 1 000 °C	0.027 °C		
use with Thermocouple	With 0 °C RJ	0.27		
Type AuPt <sup>F</sup>	With internal RJ	A		
Temperature Simulation	-50 °C to 1 768 °C	0.033 °C + 0.000 90 % of		
use with Thermocouple	With 0 °C RJ	reading		
Type R <sup>F</sup>	With internal RJ	0.14 °C		
Temperature Simulation	-50 °C to 1 768 °C	0.032 °C + 0.001 2 % of reading		
use with Thermocouple	With 0 °C RJ	0.14 °C		
Type S <sup>F</sup>	With internal RJ			
Temperature Simulation	420 °C to 1 820 °C	0.039 °C		
use with Thermocouple	With 0 °C RJ	0.33 °C		
Type B <sup>F</sup>	With internal RJ			
Temperature Simulation	-200 °C to 1 200 °C	0.017°C + 0.001 5 % of reading		
use with Thermocouple	With 0 °C RJ	0.14 °C		
Type J <sup>F</sup>	With internal RJ			
Temperature Simulation	-200 °C to 400 °C	0.015 °C		
use with Thermocouple	With 0 °C RJ	0.13 °C - 0.006 7 % of reading		
Type T <sup>F</sup>	With internal RJ			
Temperature Simulation	-200 °C to 1 000 °C	0.017 °C - 0.001 3 % of reading		
use with Thermocouple	With 0 °C RJ	0.14 °C	<i>x</i>	
Type E <sup>F</sup>	With internal RJ			
Temperature Simulation	-200 °C to 1 300 °C	0.020 °C + 0.001 8 % of reading		
use with Thermocouple	With 0 °C RJ	0.15 °C		
Type K <sup>F</sup>	With internal RJ			
Temperature Simulation	-200 °C to 1 300 °C	0.021 °C + 0.001 2 % of reading		
use with Thermocouple	With 0 °C RJ	0.14 °C		
Type N <sup>F</sup>	With internal RJ			
Temperature Simulation	0 °C to 2 310 °C	0.010 °C + 0.004 4 % of reading		
use with Thermocouple	With 0 °C RJ	0.22 °C		
Type C <sup>F</sup>	With internal RJ			
Temperature Simulation	0 °C to 2 500 °C	0.011 °C + 0.004 4 % of reading		
use with Thermocouple	With 0 °C RJ	0.23 °C		
Type A <sup>F</sup>	With internal RJ			



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Electrical				
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Calibration.	-200 °C to 850 °C	0.002.0% of reading $+ 0.005$ °C	Agilent 34420A	Euramet cg-11
Indication and Control		·····g ·····	Datron 1271	
Equipment used with			Valhalla Scientific	
RTD <sup>F</sup>			2724A	
Temperature Simulation use	-200 °C to 850 °C	$0.001.9\%$ of reading $\pm 0.005$ °C	Agilent 34420A	
with Resistance	200 0 10 050 0	0.001 9 70 01 reading + 0.003 °C	Datron 1271	
thermometer <sup>F</sup>			Dauon 1271	
Temperature Calibration	0 °C to 1 500 °C	0.44°C	A gilent 3/1/20 A	
Indication and Control	With 0 °C PI	0.44 C	Agliciii 34420A	
Equipment used with	With internal <b>P</b> I	0.34 C	CE Druger DDI 620 CE	
There a courd a Turne Dt/Dd Q			GE DIUCK DPI 020-CE	
	0.00 +- 1.000.00	0.2890		
I emperature Calibration,		0.38°C		
Indication and Control	With 0°C KJ	0.49-0		
Equipment used with	with internal RJ			
Thermocouple Type Au/Pt <sup>o</sup>	50.00 1.700.00	0.5(0)	7	
Temperature Calibration,	-50 °C to 1 768 °C	0.56°C		
Indication and Control	With 0 °C RJ	0.68°C		
Equipment used with	With internal RJ			
Thermocouple Type R <sup>0</sup>				
Temperature Calibration,	-50 °C to 1 768 °C	0.54°C		
Indication and Control	With 0 °C RJ	0.66°C		
Equipment used with	With internal RJ			
Thermocouple Type S <sup>O</sup>				
Temperature Calibration,	420 °C to 1 820 °C	0.54°C		
Indication and Control	With 0 °C RJ	0.65°C		
Equipment used with	With internal RJ			
Thermocouple Type B <sup>O</sup>				
Temperature Calibration,	-200 °C to 1 200 °C			
Indication and Control	With 0 °C RJ	0.15°C		
Equipment used with	With internal RJ	0.24°C		
Thermocouple Type J <sup>O</sup>				
Temperature Calibration,	-200 °C to 400 °C	0.16°C		
Indication and Control	With 0 °C RJ	0.24°C		
Equipment used with	With internal RJ			
Thermocouple Type T <sup>O</sup>				
Temperature Calibration,	-200 °C to 1 000 °C	0.13°C		
Indication and Control	With 0 °C RJ	0.22°C		
Equipment used with	With internal RJ			
Thermocouple Type E <sup>O</sup>				
Temperature Calibration,	-200 °C to 1 300 °C	0.19°C		
Indication and Control	With 0 °C RJ	0.27°C		
Equipment used with	With internal RJ			
Thermocouple Type K <sup>O</sup>				



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Electrical	-		_	
MEASURED INSTRUMENT	RANGE (AND	CALIBRATION AND MEASUREMENT	CALIBRATION FOULPMENT AND	CALIBRATION MEASUREMENT
QUANTITY OR GAUGE	SPECIFICATION	CAPABILITY EXPRESSED	REFERENCE	MEASUREMENT METHOD OR
	WHERE	AS AN UNCERTAINTY (±)	STANDARDS USED	PROCEDURES USED
Temperature Calibration	-200 °C to 1 300 °C	0.24°C with 0.°C R I	Agilent 34420A	Euramet co-11
Indication and Control	With 0 °C RJ	0.30°C with internal RJ	Datron 1271	L'aramereg II
Equipment used with	With internal RJ		GE Druck DPI 620-CE	
Thermocouple Type N <sup>O</sup>				
Temperature Calibration,	0 °C to 2 310 °C	0.53°C with 0 °C RJ		
Indication and Control	With 0 °C RJ	0.56°C with internal RJ		
Equipment used with	With internal RJ			
Thermocouple Type C <sup>O</sup>				
Temperature Calibration,	0 °C to 2 500 °C	0.59°C with 0 °C RJ		
Indication and Control	With 0 °C RJ	0.62°C with internal RJ		
Equipment used with	With internal RJ			
Thermocouple Type A <sup>O</sup>				
Temperature Calibration,	-200 °C to 850 °C	0.17 °C	Agilent 34420A	
Indication and Control			Datron 1271	
Equipment used with RTD <sup>O</sup>			GE Druck DPI 620-CE	
Temperature simulation use	0 °C to 1 500 °C	0.82 °C	Agilent 34420A	
with Thermocouple Type PtPd	With 0 °C RJ	0.88 °C	Datron 1271	
0	With internal RJ		Agilent 34970A	
Temperature Simulation use	0 °C to 1 000 °C	0.72 °C		
with Thermocouple Type	With 0°C RJ	0.78 °C		
AuPt	With internal RJ	1100		
I emperature Simulation use	-50 °C to 1 /68 °C	1.1 °C		
with Thermocouple Type R	With 0 °C KJ With internal DI	1.1 °C		
Tomporatura Simulation 1150	50 °C to 1 768 °C	11°C		
with Thermocourle Type S $^{0}$	With 0 °C RI	1.1 °C		
with Thermocoupie Type S	With internal RI	1.1 C		
Temperature Simulation use	420 °C to 1 820 °C	11°C		
with Thermocouple. Type $B^{0}$	With 0 °C RJ	1.1 °C		
with infinite couple Type D	With internal RJ			
Temperature Simulation use	-200 °C to 1 200 °C	0.20 °C		
with Thermocouple Type J <sup>O</sup>	With 0 °C RJ	0.27 °C		
1 21	With internal RJ			
Temperature Simulation use	-200 °C to 400 °C	0.28 °C		
with Thermocouple Type T <sup>O</sup>	With 0 °C RJ	0.34 °C		
	With internal RJ			
Temperature Simulation use	-200 °C to 1 000 °C	0.18 °C		
with Thermocouple Type E $^{\rm O}$	With 0 °C RJ	0.26 °C		
	With internal RJ			
Temperature Simulation	-200 °C to 1 300 °C	0.000		
use with Thermocouple	With 0 °C RJ	0.29 °C		
Type K <sup>o</sup>	With internal KJ	0.34 °C		



### AG METROLOGY S.r.l.

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Electrical				
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature Simulation	-200 °C to 1 300 °C	0.44 °C	Agilent 34420A Datron	Euramet cg-11
use with Thermocouple	With 0 °C RJ	0.48 °C	1271 Agilent 34970A	-
Type N <sup>O</sup>	With internal RJ			
Temperature Simulation use	0 °C to 2 310 °C	0.51 °C		
with Thermocouple Type C <sup>O</sup>	With 0 °C RJ	0.54 °C		
	With internal RJ			
Temperature Simulation	0 °C to 2 500 °C	0.60 °C		
use with Thermocouple	With 0 °C RJ	0.63 °C		
TypeA <sup>o</sup>	With internal RJ			
Temperature Simulation	-200 °C to 850 °C	0.17 °C	Agilent 34420A	
use with Resistance			Datron 1271	
Thermometer <sup>O</sup>			Agilent 34970A	

Mechanical			7	
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Absolute Pneumatic Pressure transducers, pressure transmitters, manometers F	Up to 172 kPa 172 kPa to 7 MPa	0.006 3 % of reading + 0.41 Pa 0.004 4 % of reading + 2.1 Pa	Ruska 2465	Euramet Calibration Guide No. 17
Gage Pneumatic Pressure transducers, pressure transmitters, manometers <sup>F</sup> Vacuum Gage Pneumatic Pressure transducers, pressure transmitters, manometers <sup>F</sup>	Atm to 172 kPa 172 kPa to 7 MPa -95 kPa to Atm	0.006 5 % of reading + 0.12 Pa 0.004 4 % of reading + 2.0 Pa 0.31 Pa - 0.006 5 % of reading		
Absolute Pneumatic Pressure transducers, pressure transmitters, manometers <sup>F</sup>	Up to 103 kPa 103 kPa to 2 MPa 2 MPa to 7 MPa	0.011 % of reading + 2.2 Pa 0.012 % of reading + 1.1 Pa 0.012 % of reading + 11 Pa	Ruska 2465 Ruska 2400 Druck DPI 515	



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#### Accreditation is granted to the facility to perform the following Calibration:

Mechanical				
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Gage Pneumatic	Atm to 103 kPa	0.011 % of reading + 2.1 Pa	Ruska 2465	Euramet
Pressure transducers,	103 kPa to 2 MPa	0.012 % of reading + 1.0 Pa	Ruska 2400	Calibration Guide
pressure transmitters, manometers <sup>F</sup>	2 MPa to 7 MPa	0.012 % of reading + 11 Pa	Druck DPI 515	No. 1 /
	7 MPa to 21 MPa	0.014 % of reading		
Vacuum Gage Pneumatic	-95 kPa to Atm	2.1 Pa - 0.011 % of reading		
Pressure transducers,				
manometers <sup>F</sup>				
Gage Oil	Up to 16 MPa	0.007 9 % of reading + 77 Pa	Ruska 2400	
Pressure transducers,	16MPa to 100 MPa	0.006 5 % of reading + 0.21		
pressure transmitters,		kPa		
manometers <sup>1</sup>		0.000 0/ C 1' + (1 D	D 1 0465	
Gage Pneumatic	Atm to 1 MPa	0.020 % of reading + 61 Pa	Ruska 2465	
Pressure transducers,	1 MPa to 10 MPa	0.030 % of reading	Ruska 2400	
manometers <sup>O</sup>			CE Ge Druck PM	
Vacuum Gage Pneumatic	-95 kPa to Atm	0.020 % of reading + 61 Pa	620	
Pressure transducers,			0	
pressure transmitters,				
manometers <sup>O</sup>				
Gage Oil	Atm to 10 MPa	0.026 % of reading + 88 Pa		
Pressure transducers,	10 MPa to 100 MPa	0.027 % of reading + 64 Pa		
pressure transmitters,				
manometers <sup>O</sup>				

#### Thermodynamic

MEASURED	RANGE	CALIBRATION AND	CALIBRATION	CALIBRATION
INSTRUMENT,	(AND SPECIFICATION	MEASUREMENT	EQUIPMENT AND	MEASUREMENT
QUANTITY OR GAUGE	WHERE APPROPRIATE)	CAPABILITY	REFERENCE	METHOD OR
		EXPRESSED	STANDARDS USED	PROCEDURES USED
		AS AN		
		UNCERTAINTY (±)		
Temperature measurement	50 °C to 300 °C	0.23 °C	Fluke 7380	ASTM E220
Thermocouple Pt/Pd <sup>F</sup>	300 °C to 450 °C	0.20 °C	East Tester ET3875-300	Euramet
		0.20	Pond Engineering K34XR	Calibration Guide
	450 °C to 600 °C	0.22 °C	Nabertherm RD30/200/13	No. 8
	600 °C to 1 000 °C	0.62 °C	SPRT Rosemount 162CE	
	1 000 °C to 1 300 °C	13°C	PRT Fluke 5628	
		1.5 C	Thermocouple Pt/Pd	
			Agilent 34420A	
			Fluke 1590	



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Ihermodynam	10			1
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature	50 °C to 300 °C	0.23 °C	Fluke 7380	ASTM E220 Euramet
measurement	300 °C to 450 °C	0.20 °C	East Tester ET3875-300	Calibration Guide
Thermocoupie Aut t	450 °C to 600 °C	0.22 °C	K34XR	NO. 8
	600 °C to 1 000 °C	0.62 °C	Nabertherm	
Temperature	-50 °C to 50°C	0.32 °C	RD30/200/13	
measurement	50 °C to 300 °C	0.23 °C	PRT Fluke 5628	
I hermocouple K	300 °C to 450 °C	0.20 °C	Thermocouple Pt/Pd	
	450 °C to 600 °C	0.22 °C	Agilent 34420A	
	600 °C to 1 000 °C	0.62 °C	Fluke 1590	
	1 000 °C to 1 300 °C	1.3 °C		
Temperature	-50 °C to 50 °C	0.32 °C		
measurement	50 °C to 300 °C	0.23 °C		
Thermocouple S <sup>1</sup>	300 °C to 450 °C	0.20 °C		
	450 °C to 600 °C	0.22 °C		
	600 °C to 1 000 °C	0.62 °C		
	1 000 °C to 1 300 °C	1.3 °C		
Temperature	50 °C to 300 °C	0.46 °C		
measurement	300 °C to 450 °C	0.20 °C		
Thermocoupie B	450 °C to 600 °C	0.22 °C		
	600 °C to 1 000 °C	0.62 °C		
	1 000 °C to 1 300 °C	1.3 °C		
Temperature	-80 °C to 50 °C	0.15 °C		
measurement	50 °C to 300 °C	0.23 °C		
I hermocouple J	300 °C to 450 °C	0.27 °C		
	450 °C to 600 °C	0.32 °C		
	600 °C to 1 000 °C	1.1 °C		
	1 000 °C to 1 200 °C	1.6 °C		
Temperature	-80 °C to 50 °C	0.13 °C		
measurement	50 °C to 300 °C	0.13 °C		
Thermocoupie 1	300 °C to 400 °C	0.27 °C		



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Thermodynan	nıc			
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Temperature	-80 °C to 50 °C	0.15 °C	Fluke 7380	ASTM E220
measurement	50 °C to 300 °C	0.23 °C	East Tester ET3875-300	Euramet
I nermocouple E	300 °C to 450 °C	0.24 °C	Nabertherm RD30/200/13	No. 8
	450 °C to 600 °C	0.32 °C	SPRT Rosemount 162CE	1.0.0
	600 °C to 1 000 °C	1.1 °C	PRT Fluke 5628	
Temperature	-80 °C to 50°C	0.15 °C	A gilent 34420 A	
measurement	50 °C to 300 °C	0.23 °C	Fluke 1590	
I hermocouple K	300 °C to 450 °C	0.24 °C		
	450 °C to 600 °C	0.26 °C		
	600 °C to 1 000 °C	1.1 °C		
	1 000 °C to 1 300 °C	1.7 °C		
Temperature	-80 °C to 50°C	0.15 °C		
measurement Thermocouple N <sup>F</sup>	50 °C to 300 °C	0.23 °C		
	300 °C to 450 °C	0.24 °C		
	450 °C to 600 °C	0.26 °C		
	600 °C to 1 000 °C	1.1 °C		
	1 000 °C to 1 300 °C	1.7 °C		
Temperature	50 °C to 300°C	0.23 °C		
measurement	300 °C to 450 °C	0.25 °C		
I nermocouple C	450 °C to 600 °C	0.27 °C		
	600 °C to 1 000 °C	1.1 °C		
	1 000 °C to 1 300 °C	1.7 °C		
Temperature	50 °C to 300°C	0.23 °C		
measurement	300 °C to 450 °C	0.25 °C		
Thermocouple A <sup>r</sup>	450 °C to 600 °C	0.27 °C		
	600 °C to 1 000 °C	1.1 °C		
	1 000 °C to 1 300 °C	1.7 °C		
Thermocouple Reference Junction Probe R <sup>F</sup>	0 °C to 50 °C	0.068 °C	Fluke 7380 East Tester ET3875-300 SPRT Rosemount 162CE	ASTM E2730
Thermocouple Reference Junction Probe S <sup>F</sup>	0 °C to 50 °C	0.068 °C	PRT Fluke 5628 Agilent 34420A Fluke 1590	



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Ihermodynan	Thermodynamic			
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Thermocouple	0 °C to 50 °C	0.054 °C	Fluke 7380	ASTM E2730
Reference Junction			East Tester ET3875-300	
Probe J <sup>F</sup>			SPRT Rosemount 162CE	
Thermocouple	0 °C to 50 °C	0.072 °C	PRT Fluke 5628	
Reference Junction			Agilent 34420A	
Probe 1 <sup>1</sup>	0 °C to 50 °C	0.056.90	Fluke 1390	
Peference Junction	0 C 10 30 C	0.030 C		
Probe E <sup>F</sup>				
Thermocouple	0 °C to 50 °C	0.070 °C		
Reference Junction				
Probe K <sup>F</sup>				
Thermocouple	0 °C to 50 °C	0.053 °C		
Reference Junction				
Probe N <sup>F</sup>				
Temperature	Ce       0 °C to 150°C       0.79°C       Additel 875-155         Additel 875-660       Additel 875-660       Additel 875-660	Additel 875-155	ASTM E220	
Thermocouple Pt/Pd <sup>O</sup>	150 °C to 420 °C	0.67 °C	- Nabertherm RD30/200/13 SPRT Rosemount 162CE	Guide No. 8
	420 °C to 600 °C	0.48 °C		
	600 °C to 1 050 °C	0.96 °C	PRT Fluke 5628	
	1 050 °C to 1 300 °C	1.3 °C	Agilent 34420A	
Temperature	0 °C to 150°C	0.70 °C	Agilent 34970A	
Thermocouple AuPt <sup>0</sup>	150 °C to 420 °C	0.67 °C		
Thermocoupic Aur t	420 °C to 600 °C	0.36 °C		
	600 °C to 1 000 °C	0.96 °C		
Temperature	-40 °C to 150°C	1.1 °C	Additel 875-155	
measurement	150 °C to 420 °C	0.55 °C	Additel 8/5-660	
Thermocoupie K	420 °C to 600 °C	0.46 °C	SPRT Rosemount 162CE	
	600 °C to 1 050 °C	0.99 °C	PRT Fluke 5628	
	1 050 °C to 1 300 °C	1.3 °C	Thermocouple Pt/Pd	
Temperature	-40 °C to 150°C	0.99 °C	Agilent 34970A	
measurement	150 °C to 420 °C	0.56 °C		
	420 °C to 600 °C	0.50 °C		
	600 °C to 1 050 °C	1.0 °C		
	1 050 °C to 1 300 °C	1.3 °C		



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

$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	ON ENT DR <u>USED</u> ration
QUANTITY OR GAUGEWHERE APPROPRIATE)CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )REFERENCE STANDARDS USEDMETHOD OF PROCEDURES UTemperature measurement Thermocouple B °150 °C to 420 °C2.7 °CAdditel 875-155ASTM E220 $420 °C to 600 °C$ $600 °C to 1 050 °C0.96 °CAdditel 875-660Euramet CalibraGuide No. 81050 °C to 1 050 °C1.0 °C to 1 300 °C1.1 °CSPRT Rosemount162CE PRT FlukeGuide No. 8Temperaturemeasurement-40 °C to 150 °C150 °C to 420 °C0.98 °C5628Thermocouple Pt/Pd$	OR USED ration
Temperature measurement Thermocouple B $^{\circ}$ 150 $^{\circ}$ C to 420 $^{\circ}$ C2.7 $^{\circ}$ CAdditel 875-155 Additel 875-660 SPRT Rosemount 162CE PRT Fluke 5628 	ration
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	ration
Thermocouple B $^{\circ}$ 600 $^{\circ}$ C to 1 050 $^{\circ}$ C1.1 $^{\circ}$ CNabertherm RD30/200/13Guide No. 81 050 $^{\circ}$ C to 1 300 $^{\circ}$ C1.3 $^{\circ}$ C162CE PRT FlukeTemperature measurement-40 $^{\circ}$ C to 150 $^{\circ}$ C0.18 $^{\circ}$ C5628Thermocouple Pt/Pd150 $^{\circ}$ C to 420 $^{\circ}$ C0.27 $^{\circ}$ C	
Image: 1050 °C to 1 300 °C1.3 °CSFRFRommentTemperature measurement $-40$ °C to 150°C $0.18$ °C $162CE$ PRT Fluke 5628Thermocouple Pt/Pd $150$ °C to 420 °C $0.27$ °CThermocouple Pt/Pd	
Temperature measurement-40 °C to 150°C0.18 °C5628150 °C to 420 °C0.27 °CThermocouple Pt/Pd	
measurement 150 °C to 420 °C 0.27 °C Thermocouple Pt/Pd	
$\Delta a = 1 \pm 0$ $\Delta a = 1 \pm 0$ $\Delta a = 1 \pm 0$	
Inermocouple J ° Agineti 54420 A   420 °C to 600 °C 0.34 °C   Agilent 34970A	
600 °C to 1 050 °C 1.3 °C	
1 050 °C to 1 200 °C 1.6 °C	
Temperature measurement -40°C to 150°C 0.19 °C	
Thermocouple T $^{0}$ 150°C to 400°C 0.27 °C	
Temperature-40 °C to 150°C0.17 °C	
measurement 150 °C to 420 °C 0.27 °C	
420 °C to 600 °C 0.34 °C	
600 °C to 1 000 °C 1.3 °C	
Temperature-40 °C to 150°C0.19 °C	
Thermosouple K <sup>Q</sup> 150 °C to 420 °C 0.28 °C	
420 °C to 600 °C 0.35 °C	
600 °C to 1 050 °C 1.3 °C	
1 050 °C to 1 300 °C 1.7 °C	
Temperature-40 °C to 150°C0.19 °CAdditel 875-155	
measurement 150 °C to 420 °C 0.28 °C Additel 875-660   Thermocourle N ° Nabertherm PD30/200/13	
420 °C to 600 °C 0.35 °C SPRT Rosemount	
600 °C to 1 050 °C 1.3 °C 162CE PRT Fluke 5628	
$1\ 050\ ^{\circ}C\ to\ 1\ 300\ ^{\circ}C$	
Temperature measurement 0 °C to 150°C 0.34 °C	
Thermocouple C $^{\circ}$ 150 °C to 420 °C 0.34 °C	
420 °C to 600 °C 0.40 °C	
600 °C to 1 050 °C 1.4 °C	
1 050 °C to 1 300 °C 1.7 °C	
Temperature0 °C to 150°C0.34 °C	
$\begin{array}{c} \text{measurement} \\ \text{Thermocouple } A^{\circ} \end{array} \qquad 150 ^{\circ}\text{C to } 420 ^{\circ}\text{C} \\ \end{array} \qquad 0.34 ^{\circ}\text{C}$	
420 °C to 600 °C 0.40 °C	
600 °C to 1 050 °C 1.4 °C	
1 050 °C to 1 300 °C 1.7 °C	

*This supplement is in conjunction with certificate* #L24-422



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Inermodynamic				
MEASURED INSTRUMENT, OUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY	CALIBRATION EQUIPMENT AND REFERENCE	CALIBRATION MEASUREMENT METHOD OR
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	EXPRESSED AS AN UNCERTAINTY (±)	STANDARDS USED	PROCEDURES USED
Temperature	-80 °C to 50 °C	0.031 °C	Fluke 7380	ASTM E2593
measurement RTD	50 °C to 300 °C	0.042 °C	East Tester ET3875-300	
and thermistor	300 °C to 450 °C	0.095 °C	SPRT Rosemount 162CE	
	450 °C to 600 °C	0.15 °C	PRT Fluke 5628	
			Agilent 34420A	
	0.01 °C	0.013	Tempsens TPW cell	ASTM E1750
			Agilent 34420A	
Tourseasting	40 °C += 150 °C	0.19.90	Fluke 1590	
measurement RTD	-40 °C to 150 °C	0.18 °C	Additel 875-660	ASTM E2393
and thermistor <sup>O</sup>	150 °C to 420 °C	0.25 °C	SPRT Rosemount 162CE	
	420 °C to 600 °C	0.36 °C	PRT Fluke 5628	
			Agilent 34420A Agilent 34970A	
Digital thermometer	50 °C to 300 °C	0.24 °C	Fluke 7380	ASTM E2877
used with Thermocouple PtPd <sup>F</sup>	300 °C to 450 °C	0.21 °C	Additel 875-155 Additel 875-660 Nabertherm	
	450 °C to 600 °C	0.23 °C		
	600 °C to 1 000 °C	0.61 °C	SPRT Rosemount 162CE	
	1 000 °C to 1 300 °C	1.3 °C	Fluke 5628	
Digital thermometer	50 °C to 300 °C	0.24 °C	Datron 1271	
used with	300 °C to 450 °C	0.21 °C	Fluke 1590	
Thermocoupic Aut t	450 °C to 600 °C	0.30 °C		
	600 °C to 1 000 °C	0.61 °C		
Digital thermometer used	-50 °C to 50°C	0.35 °C		
with Thermocouple R <sup>r</sup>	50 °C to 300 °C	0.27 °C		
	300 °C to 450 °C	0.24 °C		
	450 °C to 600 °C	0.26 °C		
	600 °C to 1 000 °C	0.62 °C		
	1 000 °C to 1 300 °C	1.3 °C		
Digital thermometer used	-50 °C to 50°C	0.36 °C		
with Thermocouple S <sup>r</sup>	50 °C to 300 °C	0.28 °C		
	300 °C to 450 °C	0.26 °C		
	450 °C to 600 °C	0.27 °C		
	600 °C to 1 000 °C	0.63 °C		
	1 000 °C to 1 300 °C	1.3 °C		



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MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Digital thermometer	50 °C to 300 °C	0.31 °C	Fluke 7380	ASTM E2877
used with Thermocouple B <sup>F</sup>	300 °C to 450 °C	0.29 °C	Additel 875-155 Additel 875-660 Nabertherm	
	450 °C to 600 °C	0.30 °C	RD30/200/13	
	600 °C to 1 000 °C	0.64 °C	SPRT Rosemount 162CE	
	1 000 °C to 1 300 °C	1.3 °C	PRTFluke 5628	
Digital thermometer	-80 °C to 50 °C	0.11 °C	Datron 1271	
used with Thermocouple I <sup>F</sup>	50 °C to 300 °C	0.21 °C	Fluke 1590	
Thermocoupie 5	300 °C to 450 °C	0.23 °C		
	450 °C to 600 °C	0.25 °C		
	600 °C to 1 000 °C	1.1 °C		
	1 000 °C to 1 200 °C	1.6 °C		
Digital thermometer	-80 °C to 50 °C	0.12 °C		
used with Thermocouple T <sup>F</sup>	50 °C to 300 °C	0.12 °C		
	300°C to 400°C	0.23 °C		
Digital thermometer	-80 °C to 50 °C	0.11 °C	Fluke 7380	
used with	50 °C to 300 °C	0.21 °C	East Tester ET38/5-300	
	300 °C to 450 °C	0.22 °C	Nabertherm RD30/200/13	
	450 °C to 600 °C	0.25 °C	SPRT Rosemount 162CE	
	600 °C to 1 000 °C	1.1 °C	PRT Fluke 5628	
Digital thermometer	-80 °C to 50 °C	0.12 °C	Agilent 34420A	
used with	50 °C to 300 °C	0.21 °C	Fluke 1590	
Thermocoupie K	300 °C to 450 °C	0.23 °C		
	450 °C to 600 °C	0.25 °C		
	600 °C to 1 000 °C	1.1 °C		
	1 000 °C to 1 300 °C	1.6 °C		
Digital thermometer	-80 °C to 50 °C	0.12 °C		
used with	50 °C to 300 °C	0.21 °C		
	300 °C to 450 °C	0.23 °C		
	450 °C to 600 °C	0.25 °C		
	600 °C to 1 000 °C	1.1 °C		
	1 000 °C to 1 300 °C	1.6 °C		



### AG METROLOGY S.r.l.

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I hermodynamic		CALIDDATION AND		
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED	CALIBRATION EQUIPMENT AND REFERENCE STANDADDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Digital thermometer	50 °C to 300 °C	$0.24 ^{\circ}\text{C}$	Fluke 7380	ASTM E2877
used with	300 °C to 450 °C	0.25 °C	East Tester ET3875-300	
Thermocouple C <sup>F</sup>	450 °C to 600 °C	0.27 °C	- Pond Engineering K34XR	
	600 °C to 1 000 °C	1.1 °C	SPRT Rosemount 162CE	
	1 000 °C to 1 300 °C	1.6 °C	PRT Fluke 5628	
Digital thermometer	50 °C to 300 °C	0.24 °C	Thermocouple PtPd	
used with	300 °C to 450 °C	0.25 °C	Fluke 1590	
I hermocouple A <sup>1</sup>	450 °C to 600 °C	0.27 °C		
	600 °C to 1 000°C	1.1 °C		
	1 000 °C to 1 300 °C	1.6 °C		
Digital thermometer	0 °C to 150 °C	0.29 °C	Additel 875-155	
used with	150 °C to 420 °C	0.30 °C	Additel 875-660	
I hermocouple PtPd °	420 °C to 600 °C	0.35 °C	SPRT Rosemount 162CE	
	600 °C to 1 050 °C	0.94 °C	PRT Fluke 5628	
	1 050 °C to 1 300 °C	1.3 °C	Thermocouple PtPd	
Digital thermometer used	0 °C to 150 °C	0.29 °C	- Agilent 34420A Agilent 34970A	
with Thermocouple	150 °C to 420 °C	0.30 °C	righent 549701	
Aupt	420 °C to 600 °C	0.35 °C		
	600 °C to 1 000 °C	0.94 °C		
Digital thermometer used	-40 °C to 150 °C	0.36 °C		
with Thermocouple R <sup>O</sup>	150 °C to 420 °C	0.30 °C		
	420 °C to 600 °C	0.35 °C		
	600 °C to 1 050 °C	0.94 °C		
	1 050 °C to 1 300 °C	1.3 °C		
Digital thermometer used	-40 °C to 150 °C	0.36 °C		
with Thermocouple S <sup>O</sup>	150 °C to 420 °C	0.30 °C		
	420 °C to 600 °C	0.35 °C		
	600 °C to 1 050 °C	0.94 °C		
	1 050 °C to 1 300 °C	1.3 °C		
Digital thermometer	150 °C to 420 °C	0.30 °C		
used with	420 °C to 600 °C	0.35 °C	1	
i nermocouple B	600 °C to 1 050 °C	0.94 °C	1	
	1 050 °C to 1 300 °C	1.3 °C	1	



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		CALIDDATION AND	CALIDDATION	CALIDDATION
INSTRUMENT,	(AND SPECIFICATION	MEASUREMENT	EQUIPMENT AND	MEASUREMENT
QUANTITY OR GAUGE	WHERE APPROPRIATE)	CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	REFERENCE STANDARDS USED	METHOD OR PROCEDURES USED
Digital thermometer	-40 °C to 150 °C	0.19 °C	Additel 875-155	ASTM E2877
used with	150 °C to 420 °C	0.30 °C	Additel 875-660	
Thermocoupie J	420 °C to 600 °C	0.37 °C	SPRT Rosemount 162CE	
	600 °C to 1 050 °C	1.3 °C	PRT Fluke 5628	
	1 050 °C to 1 200 °C	1.6 °C	Thermocouple PtPd	
Digital thermometer	-40 °C to 150 °C	0.19 °C	Agilent 34420A	
used with Thermocouple T <sup>O</sup>	150 °C to 400 °C	0.30 °C		
Digital thermometer	-40 °C to 150 °C	0.19 °C		
used with	150 °C to 420 °C	0.30 °C		
	420 °C to 600 °C	0.37 °C		
	600 °C to 1 000 °C	1.3 °C		
Digital thermometer	-40 °C to 150 °C	0.19 °C	Additel 875-155	
used with Thermocouple K <sup>O</sup>	150 °C to 420 °C	0.30 °C	Additel 875-660 Nabertherm RD30/200/13 SPRT Rosemount 162CE	
	420 °C to 600 °C	0.37 °C		
	600 °C to 1 050 °C	1.3 °C	PRT Fluke 5628	
	1 050 °C to 1 300 °C	1.6 °C	Thermocouple PtPd	
Digital thermometer	-40 °C to 150 °C	0.19 °C	Agilent 34970A	
used with Thermocouple	150 °C to 420 °C	0.30 °C		
1	420 °C to 600 °C	0.38 °C		
	600 °C to 1 050 °C	1.3 °C	]	
	1050 °C to 1 300 °C	1.6 °C		
Digital thermometer	0 °C to 150 °C	0.18 °C		
used with Thermocouple C <sup>o</sup>	150 °C to 420 °C	0.30 °C		
	420 °C to 600 °C	0.37 °C		
	600 °C to 1 050 °C	1.3 °C		
	1 050 °C to 1 300 °C	1.6 °C		
Digital thermometer	0 °C to 150 °C	0.20 °C		
used with	150 °C to 420 °C	0.31 °C		
Thermocouple A <sup>-</sup>	420 °C to 600 °C	0.38 °C	]	
	600 °C to 1 050 °C	1.3 °C	]	
	1 050 °C to 1 300 °C	1.6 °C	]	



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Thermodynamic				
MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED	CALIBRATION MEASUREMENT METHOD OR PROCEDURES USED
Digital thermometer	-80 °C to 50 °C	0.030 °C	Fluke 7380	ASTM E2877
used with RTD and	50 °C to 300 °C	0.042 °C	East Tester ET3875-300	
themistor <sup>1</sup>	300 °C to 450 °C	0.095 °C	SPRT Resempent 162CE	
	450 °C to 600 °C	0.15 °C	PRT Fluke 5628	
			Agilent 34420A	
			Fluke 1590	
Digital thermometer	-40 °C to 150 °C	0.14 °C	Additel 875-155	
used with RTD and	150 °C to 420 °C	0.20 °C	Additel 875-660	
thermistor <sup>0</sup>	420 °C to 600 °C	0.31 °C	SPRT Rosemount 162CE PRT	
			Fluke 5628	
			Agilent 34420A	
Equipment to measure	-40 °C to 150 °C	0.23 °C	CI Systems SR-800-7D- LT	ASTM E2847
IR Temperature <sup>FO</sup>	150 °C to 420 °C	1.2 °C	IR-463 blackbody	
	130 C to 420 C	1.2 C	Agilent 34420A	
	420 °C to 600 °C	1.4 °C	Agilent 34970A	
	600 °C to 1 050 °C	2.3 °C	Resistance thermometer	
			Thermocouple type S	
Temperature: Dew	-25 °C to 50 °C	0.19 °C	General Eastern Optica	ASTM D4230
point hygrometer			General Eastern D2 General	
			HCAL 1104U	
Temperature: Dew	-20 °C to 50 °C	0.31 °C	General Fastern Ontica	-
point hygrometer <sup>O</sup>	20 0 10 50 0	0.51 0	General Eastern D2	
r , 8			General Eastern SIM-12H	
			Kaymont 2000	
Temperature: measuring	0 °C to 60 °C	0.16 °C	Agilent 34420A	CEM TH - 007
of temperature			Fluke 1590	
environmental conditions			Resistance thermometer	
	10.004 50.00	0.22.00	Sansel HCAL 1104U	
Temperature: measuring of	10 °C to 50 °C	0.32 °C	Agilent 34420A	
conditions in air <sup>0</sup>			Resistance thermometer	
containons in un			Kavmont 2000	



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

I IICI IIIUU YIIAIIIU MEASUDED DANCE CALIDDATION AND CALIDDATION CALIDDATION CALIDDATION				
INSTRUMENT,	(AND SPECIFICATION	MEASUREMENT	EQUIPMENT AND	MEASUREMENT
QUANTITY OR GAUGE	WHERE APPROPRIATE)	AS AN UNCERTAINTY (±)	STANDARDS USED	METHOD OR PROCEDURES USED
Temperature: controlled temperature enclosures <sup>FO</sup>	-80 °C to 150 °C	0.21 °C	Agilent 34420A	Euramet Calibration
	150 °C to 420 °C	0.63 °C	Resistance thermometer	Guide No. 13
	420 °C to 600 °C	1.2 °C	A gilent 34970A	Euramet Calibration Guide
	600 °C to 1 050 °C	2.9 °C	rightent 5 15 / 6/1	No. 20
	1 050 °C to 1 300 °C	3.8 °C		AMS 2750
				CQI-9
				DKD-R 5-7 IFC 60068
Relative humidity:	10 % RH to 90 % RH	1.4 % of reading + 0.37 %	General Eastern Optica	CEM TH – 007
measuring of relative		RH	General Eastern D2	DKD-R 5-8
humidity environmental			General Eastern Sim	
conditions in air <sup>r</sup>			12H Sansel HCAL	
Relative humidity:	10 % RH to 90 % RH	$2.6\%$ of reading $\pm 0.32\%$	General Fastern Ontica	
measuring of relative	10 /0 KH to 90 /0 KH	RH	General Eastern D2	
humidity environmental			General Eastern Sim	
conditions in air <sup>O</sup>			12H Kaymont 2000	
Relative humidity:	10 % RH to 90 % RH	3.2 % RH	General Eastern Optica	Euramet Calibration
controlled humidity			General Eastern D2	Guide N. 20
enclosures <sup>FO</sup>			General Eastern Sim 12H	DKD-R 5-7
			Resistance thermometer	IEC 60068
			Agilent 34970A	

The CMC (Calibration and Measurement Capability) stated for 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 for 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 from ideal to some degree.

- 1. The laboratories range of calibration capability for all disciplines for which they are accredited is the interval from 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 for 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 for many calibrations but by its definition it does not constitute calibration of zero capacity.
- 2. The presence of a superscript F means that the laboratory performs calibration of the indicated parameter at its fixed location.
- 3. The presence of a superscript O means that the laboratory performs calibration of the indicated parameter onsite at customer locations.

*This supplement is in conjunction with certificate* #L24-422



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#### Accreditation is granted to the facility to perform the following Calibration:

4. Measurement uncertainties obtained for calibrations performed at customer sites can be expected to be larger than the measurement uncertainties obtained at the laboratories fixed location for 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.

