

The Appendix is an integral part of  
Certificate of Accreditation No. 214/2019 of 10/05/2019

Accredited entity according to ČSN EN ISO/IEC 17025:2005:

SEC electronic s.r.o.  
Calibration Laboratory  
Arnošta z Pardubic 2762, Zelené Předměstí, 530 02 Pardubice

Field of measured quantity: **electrical quantities**

Calibration:

Nominal calibration temperature:  $(23 \pm 2) ^\circ\text{C}$

Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [ $\pm$ ] <sup>2)</sup>	Calibration procedure identification
1*	<b>DC - VOLTAGE</b> (measurement)			<b>SEC-KM-UDC</b>
	1 mV		2.7 $\mu\text{V}$	
	10 mV		2.7 $\mu\text{V}$	
	100 mV		3 $\mu\text{V}$	
	1 V		0.0016 %	
	10 V		0.0015 %	
	100 V		0.0017 %	
	1,000 V		0.0020 %	
	0 to 200 mV		6 $\mu\text{V}$	
	200 mV to 2 V		0.0032 %	
	2 V to 20 V		0.0030 %	
	20 V to 200 V		0.0034 %	
	200 V to 1,100 V		0.0040 %	
	1,100 V to 30 kV		3.0 %	
	<b>DC - VOLTAGE</b> (generation)			<b>SEC-KM-UDC</b>
	100 $\mu\text{V}$		2.7 $\mu\text{V}$	
	1 mV		2.7 $\mu\text{V}$	
	10 mV		3 $\mu\text{V}$	
	100 mV		0.0030 %	
	1 V		0.0020 %	
	10 V		0.0020 %	
	100 V		0.0020 %	
	1,000 V		0.0025 %	
	0 to 200 mV		6 $\mu\text{V}$	
	200 mV to 2 V		0.0040 %	
	2 V to 20 V		0.0040 %	
	20 V to 200 V		0.0040 %	
	200 V to 1,100 V		0.0050 %	



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2*	<b>DC - CURRENT</b> (measurement)			SEC-KM-IDC
	10 $\mu$ A		0.042 %	
	100 $\mu$ A		0.0075 %	
	1 mA		0.0075 %	
	10 mA		0.0075 %	
	100 mA		0.013 %	
	1 A		0.022 %	
	1 A		0.0090 %	
	10 A		0.010 %	
	20 A		0.030 %	
	100 A		0.050 %	
	0 to 10 $\mu$ A		0.050 % + 3.4 nA	
	10 $\mu$ A to 200 $\mu$ A		0.015 %	
	200 $\mu$ A to 2 mA		0.015 %	
	2 mA to 20 mA		0.015 %	
	20 mA to 200 mA		0.026 %	
	200 mA to 2 A		0.044 %	
	2 A to 10 A		0.020 %	
	10 A to 20 A		0.040 %	
	20 A to 100 A		0.10 %	
		<b>DC - CURRENT</b> (generation)		
10 $\mu$ A			0.042 %	
100 $\mu$ A			0.014 %	
1 mA			0.014 %	
10 mA			0.014 %	
100 mA			0.014 %	
1 A			0.028 %	
10 A			0.042 %	
20 A			0.042 %	
30 A			0.10 %	
90 A			0.20 %	
	0 to 10 $\mu$ A		0.050 % + 3.4 nA	



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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability $[\pm]^{2)}$	Calibration procedure identification
	10 $\mu$ A to 200 $\mu$ A 200 $\mu$ A to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2 A to 20 A 20 A to 90 A 30 A to 1.0 kA (applies to tong-test meters)		0.028 % 0.028 % 0.028 % 0.028 % 0.056 % 0.084 % 0.20 % 0.50 %	
3*	<b>AC - VOLTAGE</b> (measurement)			<b>SEC-KM-UAC</b>
	1 mV	10 Hz to 40 Hz 40 Hz to 10 kHz 10 kHz to 30 kHz 30 kHz to 100 kHz	25 $\mu$ V 11 $\mu$ V 35 $\mu$ V 93 $\mu$ V	
	10 mV	10 Hz to 40 Hz 40 Hz to 10 kHz 10 kHz to 30 kHz 30 kHz to 100 kHz	25 $\mu$ V 11 $\mu$ V 35 $\mu$ V 95 $\mu$ V	
	100 mV	10 Hz to 40 Hz 40 Hz to 10 kHz 10 kHz to 30 kHz 30 kHz to 100 kHz	0.031 % 0.020 % 0.058 % 0.14 %	
	1 V	10 Hz to 40 Hz 40 Hz to 10 kHz 10 kHz to 30 kHz 30 kHz to 100 kHz 100 kHz to 300 kHz 300 kHz to 1 MHz	0.018 % 0.015 % 0.030 % 0.085 % 0.58 % 3.5 %	
	10 V	10 Hz to 40 Hz 40 Hz to 10 kHz 10 kHz to 30 kHz 30 kHz to 100 kHz 100 kHz to 300 kHz 300 kHz to 1 MHz	0.018 % 0.015 % 0.030 % 0.085 % 0.58 % 3.5 %	



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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [±] <sup>2)</sup>	Calibration procedure identification
	100 V	10 Hz to 40 Hz	0.018 %	
		40 Hz to 10 kHz	0.015 %	
		10 kHz to 30 kHz	0.030 %	
		30 kHz to 100 kHz	0.085 %	
		100 kHz to 300 kHz	0.6 %	
	1,000 V	10 Hz to 40 Hz	0.034 %	
		40 Hz to 10 kHz	0.030 %	
		10 kHz to 30 kHz	0.045 %	
		30 kHz to 100 kHz	0.095 %	
	1 mV to 10 mV	10 Hz to 40 Hz	35 μV	
		40 Hz to 10 kHz	22 μV	
		10 kHz to 30 kHz	60 μV	
		30 kHz to 100 kHz	95 μV	
	10 mV to 200 mV	10 Hz to 40 Hz	0.062 %	
		40 Hz to 10 kHz	0.040 %	
		10 kHz to 30 kHz	0.11 %	
		30 kHz to 100 kHz	0.28 %	
	100 mV to 200 V	100 kHz to 300 kHz	1.2 %	
	100 mV to 20 V	300 kHz to 1 MHz	7.0 %	
	200 mV to 200 V	10 Hz to 40 Hz	0.036 %	
		40 Hz to 10 kHz	0.030 %	
		10 kHz to 30 kHz	0.060 %	
		30 kHz to 100 kHz	0.17 %	
	200 V to 1,100 V	10 Hz to 40 Hz	0.068 %	
		40 Hz to 10 kHz	0.060 %	
		10 kHz to 30 kHz	0.090 %	
		30 kHz to 100 kHz	0.19 %	
	1 kV to 12 kV	50 Hz	0.60 %	

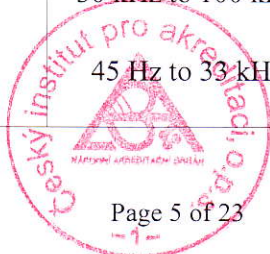


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	<b>AC - VOLTAGE</b> (generation)			<b>SEC-KM-UAC</b>
	1 mV	10 Hz to 31 Hz 32 Hz to 33 kHz 30 kHz to 100 kHz 100 kHz to 300 kHz 300 kHz to 1 MHz	13 μV 13 μV 13 μV 2.7 % 4.7 %	
	10 mV	10 Hz to 31 Hz 32 Hz to 33 kHz 30 kHz to 100 kHz 100 kHz to 300 kHz 300 kHz to 1 MHz	18 μV 17 μV 22 μV 0.53 % 1.6 %	
	100 mV	10 Hz to 31 Hz 32 Hz to 33 kHz 30 kHz to 100 kHz 100 kHz to 300 kHz 300 kHz to 1 MHz	0.070 % 0.060 % 0.12 % 0.32 % 1.2 %	
	1 V	10 Hz to 31 Hz 32 Hz to 33 kHz 30 kHz to 100 kHz 100 kHz to 300 kHz 300 kHz to 1 MHz	0.047 % 0.030 % 0.045 % 0.17 % 0.93 %	
	10 V	10 Hz to 31 Hz 32 Hz to 33 kHz 30 kHz to 100 kHz 100 kHz to 300 kHz 300 kHz to 1 MHz	0.047 % 0.030 % 0.045 % 0.17 % 0.93 %	
	100 V	10 Hz to 31 Hz 32 Hz to 33 kHz 30 kHz to 100 kHz	0.047 % 0.030 % 0.047 %	
	1,000 V	45 Hz to 33 kHz	0.059 %	



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	1 mV to 10 mV	10 Hz to 31 Hz 32 Hz to 33 kHz 30 kHz to 100 kHz 100 kHz to 300 kHz 300 kHz to 1 MHz	36 μV 34 μV 44 μV 5.0 % 8.0 %	
	10 mV to 200 mV	10 Hz to 31 Hz 32 Hz to 33 kHz 30 kHz to 100 kHz 100 kHz to 300 kHz 300 kHz to 1 MHz	0.14 % 0.12 % 0.24 % 1.0 % 3.2 %	
	200 mV to 20 V	30 kHz to 100 kHz 100 kHz to 300 kHz 300 kHz to 1 MHz	0.090 % 0.70 % 2.0 %	
	200 mV to 200 V	10 Hz to 31 Hz 32 Hz to 33 kHz	0.090 % 0.060 %	
	20 V to 200 V	30 kHz to 100 kHz	0.090 %	
	200 V to 1,000 V	45 Hz to 33 kHz	0.11 %	
<b>4*</b>	<b>AC - CURRENT</b> (measurement)			<b>SEC-KM-IAC</b>
	10 μA	10 Hz to 1 kHz	0.26 %	
	100 μA	10 Hz to 1 kHz	0.06 %	
	1 mA	10 Hz to 1 kHz	0.050 %	
	10 mA	10 Hz to 1 kHz	0.050 %	
	100 mA	10 Hz to 1 kHz	0.050 %	
	1 A	10 Hz to 1 kHz	0.10 %	
	10 A	10 Hz to 1 kHz	0.070 %	
	20 A	10 Hz to 1 kHz	0.070 %	
	50 A	10 Hz to 1 kHz	0.075 %	
	10 μA to 200 μA	10 Hz to 1 kHz	0.26 %	
	200 μA to 200 mA	10 Hz to 1 kHz	0.10 %	
	200 mA to 2 A	10 Hz to 1 kHz	0.20 %	
	2 A to 50 A	10 Hz to 1 kHz	0.20 %	



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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [ $\pm$ ] <sup>2)</sup>	Calibration procedure identification
	<b>AC - CURRENT</b> (generation)			<b>SEC-KM-IAC</b>
	10 $\mu$ A	10 Hz to 1 kHz	0.35 %	
	100 $\mu$ A	10 Hz to 1 kHz	0.083 %	
	1 mA	10 Hz to 1 kHz	0.066 %	
	10 mA	10 Hz to 1 kHz	0.065 %	
	100 mA	10 Hz to 1 kHz	0.065 %	
	1 A	10 Hz to 1 kHz	0.085 %	
	10 A	10 Hz to 1 kHz	0.20 %	
	20 A	10 Hz to 1 kHz	0.20 %	
	30 A	15 Hz to 1 kHz	0.20 %	
	10 $\mu$ A to 200 $\mu$ A	10 Hz to 1 kHz	0.17 %	
	200 $\mu$ A to 200 mA	10 Hz to 1 kHz	0.13 %	
	200 mA to 2 A	10 Hz to 1 kHz	0.17 %	
	2 A to 20 A	10 Hz to 1 kHz	0.40 %	
	20 A to 30 A	15 Hz to 1 kHz	0.40 %	
	30 A to 90 A	15 Hz to 1 kHz	0.50 %	
	30 A to 1.0 kA (applies to tong-test meters)	50 Hz to 100 Hz	0.70 %	
<b>5*</b>	<b>DC - RESISTANCE</b> (measurement)			<b>SEC-KM-R</b>
	100 $\mu\Omega$		0.058 %	
	1 m $\Omega$		0.0060 %	
	10 m $\Omega$		0.0060 %	
	100 m $\Omega$		0.0060 %	
	1 $\Omega$		0.0025 %	
	10 $\Omega$		0.0025 %	
	100 $\Omega$		0.0025 %	
	1 k $\Omega$		0.0025 %	
	10 k $\Omega$		0.0025 %	
	100 k $\Omega$		0.0025 %	
	1 M $\Omega$		0.0030 %	
	10 M $\Omega$		0.0080 %	
	100 M $\Omega$		0.012 %	
	1 G $\Omega$		0.040 %	
	0 to 1 m $\Omega$		2.0 % + 2 $\mu\Omega$	
	1 m $\Omega$ to 100 m $\Omega$		0.50 %	



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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability $[\pm]^{2)}$	Calibration procedure identification
	100 mΩ to 1 Ω		0.10 %	
	1 Ω to 10 Ω		0.010 %	
	10 Ω to 100 Ω		0.0070 %	
	100 Ω to 1 kΩ		0.0050 %	
	1 kΩ to 10 kΩ		0.0040 %	
	10 kΩ to 100 kΩ		0.0050 %	
	100 kΩ to 1 MΩ		0.0090 %	
	1 MΩ to 10 MΩ		0.018 %	
	10 MΩ to 100 MΩ		0.090 %	
	100 MΩ to 1 GΩ		0.50 %	
	<b>DC - RESISTANCE</b> (generation)			<b>SEC-KM-R</b>
	100 μΩ		0.0040 %	
	1 mΩ		0.0020 %	
	10 mΩ		0.0010 %	
	100 mΩ		0.0010 %	
	1 Ω		0.0010 %	
	10 Ω		0.0010 %	
	100 Ω		0.0020 %	
	1 kΩ		0.0020 %	
	10 kΩ		0.0015 %	
	100 kΩ		0.0020 %	
	1 MΩ		0.0020 %	
	10 MΩ		0.0080 %	
	100 MΩ		0.011 %	
	1 GΩ		0.040 %	
	0 to 1 Ω		0.2 % + 0.4 mΩ	
	1 Ω to 10 Ω		0.020 %	
	10 Ω to 100 Ω		0.020 %	
	100 Ω to 1 kΩ		0.015 %	
	1 kΩ to 10 kΩ		0.015 %	
	10 kΩ to 100 kΩ		0.015 %	
	100 kΩ to 1 MΩ		0.020 %	
	1 MΩ to 10 MΩ		0.040 %	
	10 MΩ to 100 MΩ		0.10 %	





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	100 M $\Omega$ to 1 G $\Omega$		0.50 %	
	1 G $\Omega$ to 10 G $\Omega$		1.0 %	
	10 G $\Omega$ to 50 G $\Omega$		2.5 %	
6	AC - RESISTANCE (generation)			SEC-KM-RLC
	0.1 $\Omega$	100 Hz	0.20 %	
		1 kHz	0.20 %	
		10 kHz	1.0 %	
	1 $\Omega$	100 Hz	0.14 %	
		1 kHz	0.10 %	
		10 kHz	0.10 %	
	10 $\Omega$	100 Hz	0.050 %	
		1 kHz	0.050 %	
		10 kHz	0.050 %	
	100 $\Omega$	100 Hz	0.020 %	
		1 kHz	0.020 %	
		10 kHz	0.020 %	
	1 k $\Omega$	100 Hz	0.020 %	
		1 kHz	0.020 %	
		10 kHz	0.020 %	
	10 k $\Omega$	100 Hz	0.020 %	
		1 kHz	0.020 %	
		10 kHz	0.020 %	
	100 k $\Omega$	100 Hz	0.020 %	
		1 kHz	0.020 %	
		10 kHz	0.020 %	
	1 M $\Omega$	100 Hz	0.030 %	
		1 kHz	0.030 %	
		10 kHz	0.060 %	
	10 M $\Omega$	100 Hz	0.050 %	
		1 kHz	0.050 %	
		10 kHz	0.47 %	



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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [ ± ] <sup>2)</sup>	Calibration procedure identification
7	CAPACITY (generation) 10 pF	100 Hz	0.86 %	SEC-KM-RLC
		1 kHz	0.50 %	
		10 kHz	0.50 %	
	100 pF	100 Hz	0.30 %	
		1 kHz	0.10 %	
		10 kHz	0.050 %	
	1 nF	100 Hz	0.050 %	
		1 kHz	0.050 %	
		10 kHz	0.050 %	
	10 nF	100 Hz	0.050 %	
		1 kHz	0.050 %	
		10 kHz	0.050 %	
	100 nF	100 Hz	0.10 %	
		1 kHz	0.050 %	
		10 kHz	0.050 %	
	1 μF	100 Hz	0.050 %	
		1 kHz	0.050 %	
		10 kHz	0.050 %	
	10 μF	100 Hz	0.050 %	
		1 kHz	0.050 %	
		10 kHz	0.20 %	
	100 μF	100 Hz	0.10 %	
		1 kHz	0.13 %	
		10 kHz	0.51 %	
8	INDUCTANCE (generation) 10 μH	1 kHz	0.58 %	SEC-KM-RLC
		10 kHz	0.32 %	
	100 μH	100 Hz	0.53 %	
		1 kHz	0.22 %	
		10 kHz	0.21 %	



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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [ ± ] <sup>2)</sup>	Calibration procedure identification
	1 mH	100 Hz 1 kHz 10 kHz	0.22 % 0.11 % 0.11 %	
	10 mH	100 Hz 1 kHz 10 kHz	0.11 % 0.10 % 0.10 %	
	100 mH	100 Hz 1 kHz 10 kHz	0.10 % 0.10 % 0.10 %	
	1 H	100 Hz 1 kHz	0.10 % 0.10 %	
	10 H	100 Hz 1 kHz	0.10 % 0.10 %	
9.	<b>Generation of equivalent resistance</b> <b>For RTD type Pt 100-385</b> -200 °C to -130 °C -130 °C to -100 °C -100 °C to 0 °C 0 °C to 100 °C 100 °C to 300 °C 300 °C to 400 °C 400 °C to 500 °C 500 °C to 700 °C 700 °C to 850 °C  <b>For RTD type Pt 100-3916</b> -100 °C to 0 °C 0 °C to 100 °C 100 °C to 200 °C 200 °C to 450 °C		0.050 °C 0.065 °C 0.075 °C 0.090 °C 0.13 °C 0.14 °C 0.17 °C 0.21 °C 0.24 °C  0.070 °C 0.090 °C 0.11 °C 0.16 °C	SEC-KM-°C



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	<b>For RTD type Pt 100-3920</b>			
	-200 °C to -80 °C		0.050 °C	
	-80 °C to 0 °C		0.070 °C	
	0 °C to 100 °C		0.085 °C	
	100 °C to 200 °C		0.11 °C	
	200 °C to 400 °C		0.14 °C	
	400 °C to 600 °C		0.19 °C	
	<b>For RTD type Pt 500</b>			
	-200 °C to -130 °C		0.040 °C	
	-130 °C to -100 °C		0.045 °C	
	-100 °C to 0 °C		0.060 °C	
	0 °C to 100 °C		0.080 °C	
	100 °C to 300 °C		0.10 °C	
	300 °C to 400 °C		0.12 °C	
	400 °C to 500 °C		0.14 °C	
	500 °C to 700 °C		0.18 °C	
	700 °C to 850 °C		0.22 °C	
	<b>For RTD type Pt 1000</b>			
	-200 °C to -150 °C		0.040 °C	
	-150 °C to -100 °C		0.050 °C	
	-100 °C to 0 °C		0.055 °C	
	0 °C to 100 °C		0.070 °C	
	100 °C to 300 °C		0.10 °C	
	300 °C to 400 °C		0.12 °C	
	400 °C to 500 °C		0.14 °C	
	500 °C to 700 °C		0.18 °C	
	700 °C to 850 °C		0.21 °C	
	<b>For RTD type Cu 10</b>			
	-200 °C to -30 °C		0.40 °C	
	-30 °C to +100 °C		0.45 °C	
	100 °C to 260 °C		0.47 °C	
	<b>For RTD type Ni 120</b>			
	-80 °C to +10 °C		0.055 °C	
	10 °C to 260 °C		0.060 °C	



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	<b>For RTD type Ni 1000</b> -50 °C to +70 °C 70 °C to 200 °C		0.050 °C 0.055 °C	
	<b>Measurement of equivalent resistance</b> <b>For RTD type Pt 100-385</b> -200 °C to -80 °C -80 °C to +100 °C 100 °C to 400 °C 400 °C to 700 °C 700 °C to 850 °C  <b>For RTD type Pt 100-3916</b> -100 °C to -70 °C -70 °C to +10 °C 10 °C to 200 °C 200 °C to 450 °C  <b>For RTD type Pt 100-3920</b> -200 °C to -70 °C -70 °C to +100 °C 100 °C to 400 °C 400 °C to 600 °C  <b>For RTD type Pt 500</b> -200 °C to +100 °C 100 °C to 400 °C 400 °C to 850 °C  <b>For RTD type Pt 1000</b> -200 °C to -50 °C -50 °C to +500 °C 500 °C to 850 °C  <b>For RTD type Cu 10</b> -200 °C to +260 °C		0.032 °C 0.075 °C 0.080 °C 0.090 °C 0.10 °C  0.032 °C 0.070 °C 0.075 °C 0.082 °C  0.030 °C 0.072 °C 0.080 °C 0.090 °C  0.038 °C 0.12 °C 0.15 °C  0.035 °C 0.070 °C 0.080 °C  0.32 °C	SEC-KM-°C



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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [ $\pm$ ] <sup>2)</sup>	Calibration procedure identification
	<b>For RTD type Ni 120</b> -80 °C to -30 °C -30 °C to +10 °C 10 °C to 260 °C  <b>For RTD type Ni 1000</b> -50 °C to -20 °C -20 °C to +70 °C 70 °C to 200 °C		0.040 °C 0.055 °C 0.050 °C  0.035 °C 0.050 °C 0.045 °C	
10.	<b>Measurement and generation of equivalent DC voltage for thermocouples - without cold junction compensation</b> <b>Type R thermocouples</b> -40 °C to -30 °C -30 °C to +20 °C 20 °C to 90 °C 90 °C to 300 °C 300 °C to 500 °C 500 °C to 600 °C 600 °C to 1,700 °C  <b>Type S thermocouples</b> -40 °C to 0 °C 0 °C to 100 °C 100 °C to 500 °C 500 °C to 1,700 °C  <b>Type D thermocouples</b> 0 °C to 50 °C 50 °C to 100 °C 100 °C to 1,000 °C 1,000 °C to 2,400 °C		1.8 °C 1.5 °C 1.1 °C 0.90 °C 0.72 °C 0.65 °C 0.60 °C  1.5 °C 1.1 °C 0.80 °C 0.65 °C  0.72 °C 0.56 °C 0.40 °C 0.90 °C	SEC-KM-°C



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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [ ± ] <sup>2)</sup>	Calibration procedure identification
	<b>Type U thermocouples</b>			
	-190 °C to -90 °C		0.37 °C	
	-90 °C to -20 °C		0.26 °C	
	-20 °C to 0 °C		0.21 °C	
	0 °C to 600 °C		0.17 °C	
	<b>Type L thermocouples</b>			
	-190 °C to -110 °C		0.26 °C	
	-110 °C to -20 °C		0.21 °C	
	-20 °C to +600 °C		0.17 °C	
	600 °C to 900 °C		0.14 °C	
	<b>Type N thermocouples</b>			
	-250 °C to -200 °C		2.4 °C	
	-200 °C to -130 °C		0.72 °C	
	-130 °C to -100 °C		0.35 °C	
	-100 °C to +50 °C		0.30 °C	
	50 °C to 200 °C		0.26 °C	
	200 °C to 1,300 °C		0.22 °C	
	<b>Type C thermocouples</b>			
	0 °C to 50 °C		0.56 °C	
	50 °C to 100 °C		0.49 °C	
	100 °C to 200 °C		0.43 °C	
	200 °C to 1,200 °C		0.41 °C	
	1,200 °C to 1,400 °C		0.46 °C	
	1,400 °C to 1,600 °C		0.52 °C	
	1,600 °C to 1,800 °C		0.56 °C	
	1,800 °C to 2,000 °C		0.60 °C	
	2,000 °C to 2,300 °C		0.80 °C	
	<b>Type B thermocouples</b>			
	100 °C to 150 °C		7.1 °C	
	150 °C to 200 °C		3.6 °C	
	200 °C to 300 °C		2.4 °C	
	300 °C to 500 °C		1.5 °C	
	500 °C to 800 °C		0.90 °C	
	800 °C to 1,000 °C		0.80 °C	
	1,000 °C to 1,400 °C		0.65 °C	



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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [±] <sup>2)</sup>	Calibration procedure identification
	<b>Type E thermocouples</b> -250 °C to -220 °C -220 °C to -205 °C -205 °C to -200 °C -200 °C to -100 °C -100 °C to +50 °C +50 °C to 1,000 °C  <b>Type T thermocouples</b> -250 °C to -220 °C -220 °C to -205 °C -205 °C to -200 °C -200 °C to -100 °C -100 °C to 0 °C 0 °C to 200 °C 200 °C to 400 °C  <b>Type K thermocouples</b> -260 °C to -245 °C -245 °C to -205 °C -205 °C to -150 °C -150 °C to -10 °C -10 °C to +1,350 °C  <b>Type J thermocouples</b> -200 °C to -155 °C -155 °C to -110 °C -110 °C to -5 °C -5 °C to +1,150 °C		0.72 °C 0.39 °C 0.29 °C 0.19 °C 0.17 °C 0.14 °C  1.1 °C 0.56 °C 0.46 °C 0.27 °C 0.23 °C 0.19 °C 0.16 °C  2.4 °C 1.1 °C 0.46 °C 0.26 °C 0.23 °C  0.34 °C 0.24 °C 0.20 °C 0.17 °C	
	<b>Measurement and generation of equivalent DC voltage for thermocouples - with cold junction compensation</b> <b>Type K thermocouples</b> -260 °C to -240 °C -240 °C to -200 °C -200 °C to -100 °C		4.8 °C 2.1 °C 0.90 °C	SEC-KM-°C



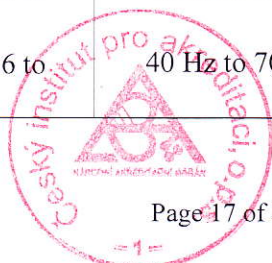


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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [±] <sup>2)</sup>	Calibration procedure identification
	-100 °C to 0 °C 0 °C to +50 °C 50 °C to +700 °C 700 °C to 1,200 °C 1,200 °C to +1,350 °C  <b>Type J thermocouples</b> -200 °C to -150 °C -150 °C to -100 °C -100 °C to 0 °C 0 °C to 50 °C 50 °C to 100 °C 100 °C to 500 °C 500 °C to 900 °C 900 °C to 1,000 °C 1,000 °C to +1,150 °C		0.48 °C 0.38 °C 0.35 °C 0.39 °C 0.43 °C  1.4 °C 0.93 °C 0.74 °C 0.62 °C 0.59 °C 0.56 °C 0.50 °C 0.52 °C 0.54 °C	
11.	<b>DC - POWER</b> <b>EL. CURRENT</b> (generation) <b>1 mVA to 20 kVA</b> for: U = 1 V to 1,000 V I = 1 mA to 20 A		0.050 %	SEC-KM-P
12*	<b>AC - POWER</b> <b>EL. CURRENT</b> (generation) <b>0.01 W to 54 kW</b> for: U = 1 V to 600 V I = 10 mA to 90 A At I ≤ 10 A, cos φ = 1 At I > 10 A, cos φ = 1 At I ≤ 10 A, cos φ = 0.8 to 0.9 At I > 10 A, cos φ = 0.8 to 0.9 At I ≤ 10 A, cos φ = 0.6 to 0.7 At I > 10 A, cos φ = 0.6 to 0.7	40 Hz to 70 Hz 40 Hz to 70 Hz 40 Hz to 70 Hz 40 Hz to 70 Hz 40 Hz to 70 Hz 40 Hz to 70 Hz	0.070 % 0.10 % 0.075 % 0.13 % 0.090 % 0.17 %	SEC-KM-P

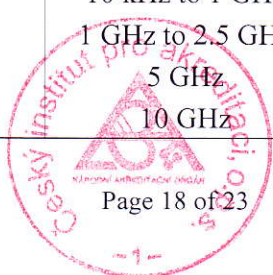


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Ordinal number 1)	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [±] 2)	Calibration procedure identification
	At $I \leq 10$ A, $\cos \varphi = 0.5$	40 Hz to 70 Hz	0.10 %	
	At $I > 10$ A, $\cos \varphi = 0.5$	40 Hz to 70 Hz	0.20 %	
	At $I \leq 10$ A, $\cos \varphi = 0.3$ to 0.4	40 Hz to 70 Hz	0.15 %	
	At $I > 10$ A, $\cos \varphi = 0.3$ to 0.4	40 Hz to 70 Hz	0.35 %	
	At $I \leq 10$ A, $\cos \varphi = 0.1$ to 0.2	40 Hz to 70 Hz	0.45 %	
	At $I > 10$ A, $\cos \varphi = 0.1$ to 0.2	40 Hz to 70 Hz	1.1 %	
	At $I \leq 10$ A, $\cos \varphi = 0.05$	40 Hz to 70 Hz	0.90 %	
	At $I > 10$ A, $\cos \varphi = 0.05$	40 Hz to 70 Hz	2.1 %	
	<b>AC - POWER EL. CURRENT</b> (measurement) <b>0.9 W to 15 kW</b> for: U = 6 V to 720 V I = 0.15 A to 21 A $\cos \varphi = 1$			<b>SEC-KM-P</b>
	1.0 < $\cos \varphi \leq 0.9$	45 Hz to 65 Hz	0.046 %	
	0.9 < $\cos \varphi \leq 0.8$	45 Hz to 65 Hz	0.060 %	
	0.8 < $\cos \varphi \leq 0.7$	45 Hz to 65 Hz	0.065 %	
	0.7 < $\cos \varphi \leq 0.6$	45 Hz to 65 Hz	0.070 %	
	0.6 < $\cos \varphi \leq 0.5$	45 Hz to 65 Hz	0.080 %	
	0.5 < $\cos \varphi \leq 0.4$	45 Hz to 65 Hz	0.090 %	
	0.4 < $\cos \varphi \leq 0.3$	45 Hz to 65 Hz	0.11 %	
	0.3 < $\cos \varphi \leq 0.2$	45 Hz to 65 Hz	0.14 %	
	0.2 < $\cos \varphi \leq 0.1$	45 Hz to 65 Hz	0.20 %	
	0.1 < $\cos \varphi \leq 0.05$	45 Hz to 65 Hz	0.39 %	
<b>13</b>	<b>POWER LEVEL</b> (generation) - load 50 $\Omega$			<b>SEC-KM-Uvf SEC-KM-OSC</b>
	-90 dBm to -80 dBm	10 kHz to 1 GHz	0.38 dB	
	-90 dBm to -80 dBm	1 GHz to 2.5 GHz	0.62 dB	
	-90 dBm to -80 dBm	5 GHz	1.2 dB	
	-90 dBm to -80 dBm	10 GHz	1.2 dB	

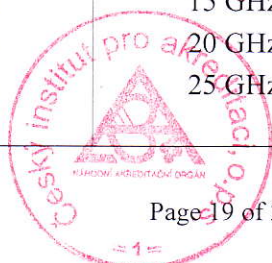


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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [ $\pm$ ] <sup>2)</sup>	Calibration procedure identification
	-80 dBm to -60 dBm	10 kHz to 1 GHz	0.38 dB	
	-80 dBm to -60 dBm	1 GHz to 2.5 GHz	0.51 dB	
	-80 dBm to -60 dBm	5 GHz	1.2 dB	
	-80 dBm to -60 dBm	10 GHz	1.2 dB	
	-80 dBm to -60 dBm	15 GHz	1.7 dB	
	-80 dBm to -60 dBm	20 GHz	1.7 dB	
	-60 dBm to 0 dBm	10 kHz to 1 GHz	0.38 dB	
	-60 dBm to 0 dBm	1 GHz to 2.5 GHz	0.51 dB	
	-60 dBm to 0 dBm	5 GHz	1.2 dB	
	-60 dBm to 0 dBm	10 GHz	1.2 dB	
	-60 dBm to 0 dBm	15 GHz	1.7 dB	
	-60 dBm to 0 dBm	20 GHz	1.7 dB	
	0 dBm to +10 dBm	10 kHz to 1 GHz	0.33 dB	
	0 dBm to +10 dBm	1 GHz to 2,5 GHz	0.47 dB	
	0 dBm to +10 dBm	5 GHz	1.2 dB	
	0 dBm to +10 dBm	10 GHz	1.2 dB	
	0 dBm to +10 dBm	15 GHz	1.7 dB	
	0 dBm to +10 dBm	20 GHz	1.7 dB	
	<b>POWER LEVEL</b> (measurement) - load 50 $\Omega$			<b>SEC-KM-Uvf</b>
	-90 dBm to -80 dBm	100 kHz to 2.5 GHz	0.3 dB	
	-90 dBm to -80 dBm	5 GHz	0.51 dB	
	-90 dBm to -80 dBm	10 GHz	0.71 dB	
	-90 dBm to -80 dBm	15 GHz	1.7 dB	
	-90 dBm to -80 dBm	20 GHz	1.7 dB	
	-90 dBm to -80 dBm	25 GHz	1.7 dB	
	-80 dBm to -60 dBm	100 kHz to 2.5 GHz	0.3 dB	
	-80 dBm to -60 dBm	5 GHz	0.51 dB	
	-80 dBm to -60 dBm	10 GHz	0.71 dB	
	-80 dBm to -60 dBm	15 GHz	1.7 dB	
	-80 dBm to -60 dBm	20 GHz	1.7 dB	
	-80 dBm to -60 dBm	25 GHz	1.7 dB	



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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [±] <sup>2)</sup>	Calibration procedure identification
	-60 dBm to +10 dBm	100 kHz to 2.5 GHz	0.3 dB	
	-60 dBm to +10 dBm	5 GHz	0.51 dB	
	-60 dBm to +10 dBm	10 GHz	0.71 dB	
	-60 dBm to +10 dBm	15 GHz	1.7 dB	
	-60 dBm to 0 dBm	20 GHz	1.7 dB	
	-60 dBm to 0 dBm	25 GHz	1.7 dB	
	+10 dBm to +20 dBm	100 kHz to 200 MHz	0.35 dB	
	+10 dBm to +20 dBm	200 MHz to 1 GHz	0.55 dB	
	+10 dBm to +20 dBm	1 GHz to 2.5 GHz	0.63 dB	

<sup>1)</sup> Asterisk at the ordinal number identifies the calibrations, which the Laboratory is qualified to carry out outside the permanent laboratory premises.

<sup>2)</sup> Expressed like uncertainty in accordance with the requirements of the document EA 4/02 at  $k = 2$ .

**Explanations:**

If the Calibration and Measurement Capability is stated in %, it always means % of the measured value.

For calibration outside the permanent laboratory premises, the nominal temperature for calibration is:  $(23 \pm 5) ^\circ\text{C}$ .



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**Measured instruments or devices:**

(In accordance with the above list of measured quantities and the ranges of measurement the following types of instruments or devices can be measured.)

Ordinal number	Measured instrument/device type
1	Analogue and digital voltmeters, multimeters, tong-test meters, power supplies, high-voltage testing power supplies (up to 12 kV), calibrators, instruments for certified electricians, oscilloscopes
2	Analogue and digital ammeters, multimeters, tong-test meters, power supplies, calibrators, instruments for certified electricians
3	Analogue and digital voltmeters, multimeters, tong-test meters, power supplies, high-voltage testing power supplies (up to 30 kV), calibrators, instruments for certified electricians, oscilloscopes
4	Analogue and digital ammeters, multimeters, tong-test meters, power supplies, calibrators, instruments for certified electricians
5	Ohmmeters, decade resistance boxes, resistance bridges, resistance DC attenuators, reference DC resistors, instruments for certified electricians
6 - 8	RLC-meters, multimeters
9	Electric parts of meters and temperature simulators using RTD resistors
10	Electric parts of meters and temperature simulators using thermocouples
11	Analogue and digital wattmeters, tong-test meters, calibrators, instruments for certified electricians
12	Analogue and digital wattmeters, varmeters, tong-test meters, calibrators, instruments for certified electricians, transducers
13	HF voltage generators and meters, oscilloscopes and instruments for the measurement and generation of frequency





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Ordinal number <sup>1)</sup>	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [±] <sup>2)</sup>	Calibration procedure identification
<b>3.</b>	<b>TIME STAMPS</b> (generation) $U_{pk} \geq 1 \text{ V} / 50 \Omega$ in series 5-2-1 $U_{pk} \geq 0.375 \text{ V} / 50 \Omega$ $U_{pk} \geq 0.1 \text{ V} / 50 \Omega$			<b>SEC-KM-OSC</b>
	5 s and 2 s	0.2 Hz and 0.5 Hz	$2.1 \cdot 10^{-3}$	
	(1-0.5-0.2-0.1) s	(1-2-5-10) Hz	$5.1 \cdot 10^{-4}$	
	(50-20-10) ms	(20-50-100) Hz	$3.0 \cdot 10^{-5}$	
	5 ms to 10 ns	0.2 kHz to 100 MHz	$2.5 \cdot 10^{-5}$	
	5 ns and 2 ns	(200 to 500) MHz	$2.5 \cdot 10^{-5}$	
	1 ns	1 GHz	$2.5 \cdot 10^{-5}$	

<sup>1)</sup> Asterisk at the ordinal number identifies the calibrations, which the Laboratory is qualified to carry out outside the permanent laboratory premises.

<sup>2)</sup> Expressed like uncertainty in accordance with the requirements of the document EA 4/02 at  $k = 2$ .

**Measured instruments or devices:**

(In accordance with the above list of measured quantities and the ranges of measurement the following types of instruments or devices can be measured.)

Ordinal number	Measured instrument/device type
1 - 3	Oscilloscopes and instruments for the measurement and generation of frequency

**Explanations:**

SEC-KM-X Internal calibration procedure

S/N Signal-to-Noise Ratio

$L_P$  Power level

$\tau$  gate interval

