The Appendix is an integral part of
Certificate of Accreditation No. 419/2024 of 21/8/2024

Accredited entity according to ČSN EN ISO/IEC 17025:2018:

FORTE a.s.
CAB number 2302, Metrological Laboratory
Mostkovice 529, 798 02 Mostkovice

CMC for the field of measured quantity: Electrical quantities

Ord. number[1]	Calibrated quantity / Subject of calibration	Nominal range				Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty[2]	Calibration principle	Calibration procedure identification[3]	Location
		min	unit	max	unit					
1	DC electrical voltage / multimeters, voltmeters	0	mV to	20	mV		10 µV	Voltage generation using a calibrator	KP 02/2019	
		20	mV to	40	mV		0.045 %			
		40	mV to	100	mV		0.020 %			
		100	mV to	600	mV		0.0060 %			
		600	mV to	1100	V		0.0040 %			
2	AC electrical voltage / multimeters, voltmeters	10	mV to	60	mV	32 Hz to 300 Hz	0.15 mV	Voltage generation using a calibrator	KP 02/2019 KP 14/2019	
						0.3 kHz to 30 kHz	0.15 mV			
						30 kHz to 100 kHz	0.18 mV			
		60	mV to	200	mV	32 Hz to 300 Hz	0.20 %			
						0.3 kHz to 30 kHz	0.20 %			
						30 kHz to 100 kHz	0.25 %			
		200	mV to	20	V	32 Hz to 300 Hz	0.080 %			
						0.3 kHz to 30 kHz	0.070 %			
						30 kHz to 100 kHz	0.060 %			
		20	V to	200	V	32 Hz to 300 Hz	0.080 %			
						0.3 kHz to 30 kHz	0.070 %			
						30 kHz to 100 kHz	0.12 %			
		200	V to	1000	V	32 Hz to 300 Hz	0.080 %			
						0.3 kHz to 30 kHz	0.070 %			

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Ord. number[1]	Calibrated quantity / Subject of calibration	Nominal range min	unit		max	unit	Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty[2]		Calibration principle	Calibration procedure identification[3]	Location
3	DC current / multimeters, ammeters	10	mA	to	2	mA			1.0 µA	Current generation using a calibrator	KP 02/2019	
		2	mA	to	2	A		0.05 %				
		2	A	to	20	A		0.026 %	+ 1.1 mA			
4	AC current / multimeters, ammeters	1	mA	to	2	mA	0.01 kHz to 1 kHz		3 µA	Current generation using a calibrator	KP 02/2019	
		2	mA	to	200	mA	0.01 kHz to 1 kHz	0.1 %				
		200	mA	to	2	A	0.01 kHz to 1 kHz	0.15 %				
		2	A	to	20	A	0.01 kHz to 1 kHz	0.095 %	+ 1.14 mA			
5	Electrical resistance / resistance boxes, multimeters, ohmmeters	0	Ω	to	0.5	Ω			1.0 mΩ	Direct resistance measurement using a multimeter	KP 01/2019	
		0.5	Ω	to	1	Ω		0.25 %				
		1	Ω	to	4	Ω		0.07 %				
		4	Ω	to	1	MΩ		0.035 %				
		1	MΩ	to	3	MΩ		0.06 %				
		3	MΩ	to	10	MΩ		0.035 %				
		10	MΩ	to	40	MΩ		0.30 %				
		40	MΩ	to	100	MΩ		0.15 %				
					10	Ω		0.010 %		Resistance generation using a calibrator	KP 02/2019	
					100	Ω		0.0050 %				
					1	kΩ		0.0050 %				

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					10	kΩ		0.0050 %			
					100	kΩ		0.0050 %			
					1	MΩ		0.010 %			
					10	MΩ		0.030 %			
					100	MΩ		0.050 %			
6	Electric capacity / capacity meters, RLC bridges								Generation using capacity standards	KP 04/2019	
		1	pF	to	3	pF	1 kHz	1.0 %			
		4	pF	to	7	pF	1 kHz	0.30 %			
		8	pF	to	20	pF	1 kHz	0.20 %			
		20	pF	to	1	µF	1 kHz	0.080 %			
7	Electrical inductance / inductance meters, RLC bridges								Generation using inductance standards	KP 07/2019	
					10	µH	1 kHz	0.70 %			
					100	µH	1 kHz	0.070 %			
					1	mH	1 kHz	0.070 %			
					10	mH	1 kHz	0.070 %			
					100	mH	1 kHz	0.070 %			
					1	H	1 kHz	0.070 %			
8	High-frequency power / Hf generators, signal generators, oscillators, frequency converters								Measurement using a thermoelectric sensor	KP 03/2019	
		1	µW	to	2	µW	0.01 GHz to 2 GHz	8.1 %			
							2 GHz to 12.4 GHz	9.2 %			

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Ord. number[1]	Calibrated quantity / Subject of calibration	Nominal range min	unit		max	unit	Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty[2]	Calibration principle	Calibration procedure identification[3]	Location
							12.4 GHz to 18 GHz	9.9 %			
		2	µW	to	4	µW	0.01 GHz to 2 GHz	5.0 %			
							2 GHz to 12.4 GHz	6.5 %			
							12.4 GHz to 18 GHz	7.5 %			
		2	µW	to	5	µW					
		4	µW	to	8	µW	0.01 GHz to 2 GHz	3.4 %			
		4	µW	to	7	µW	2 GHz to 12.4 GHz	5.5 %			
							12.4 GHz to 18 GHz	6.5 %			
		5	µW	to	20	µW					
		8	µW	to	30	µW	0.01 GHz to 2 GHz	3.0 %			
		7	µW	to	20	µW	2 GHz to 12.4 GHz	5.2 %			
							12.4 GHz to 18 GHz	6.4 %			
		20	µW	to	100	mW					
		30	µW	to	100	mW	0.01 GHz to 2 GHz	2.8 %			
		20	µW	to	100	mW	2 GHz to 12.4 GHz	5.1 %			
9	Inspection equipment / modulus meters, loop impedance	0.5	Ω	to	1.5	Ω	50 Hz	0.073 Ω	Loop impedance generation using a calibrator of inspection instruments	KP 18/2019	
		1.5	Ω	to	10	Ω	50 Hz	0.26 Ω			
		10	Ω	to	100	Ω	50 Hz	2.6 %			
		100	Ω	to	1800	Ω	50 Hz	2.2 %			
	meters of circuit breaker tripping current	3	mA	to	10	mA	50 Hz	0.15 mA	Tripping current generation using a calibrator of inspection instruments		

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Ord. number[1]	Calibrated quantity / Subject of calibration	Nominal range min	unit		Nominal range max	unit	Parameter(s) of the measurand	Lowest stated expanded measurement uncertainty[2]	Calibration principle	Calibration procedure identification[3]	Location
		10	mA	to	3000	mA	50 Hz	2.0 %			
	meters of tripping contact voltage	1	V	to	10	V	50 Hz	4.9 V	Contact voltage generation using a calibrator of inspection instruments		
		10	V	to	100	V	50 Hz	11 V			
	meters of transition resistance	0.1	Ω	to	1	Ω		0.019 Ω	Resistance generation using a calibrator of inspection instruments		
		1	Ω	to	10	Ω		0.042 Ω			
		10	Ω	to	10000	Ω		0.42 %			
	meters of insulation resistance	0.01	MΩ	to	1	MΩ		0.28 %	Resistance generation using a calibrator of inspection instruments		
		1	MΩ	to	10	MΩ		0.44 %			
		10	MΩ	to	1000	MΩ		0.72 %			
		1000	MΩ	to	10000	MΩ		1.4 %			
	meters of leakage current	0.1	mA	to	1	mA	50 Hz	8.6 µA	Leakage current generation using a calibrator of inspection instruments		
		1	mA	to	10	mA	50 Hz	0.86 %			
		10	mA	to	28	mA	50 Hz	0.62 %			

[1] Asterisk at the ordinal number identifies the calibrations, which the Laboratory is qualified to carry out outside the permanent laboratory premises.

[2] The expanded measurement uncertainty is in accordance with ILAC-P14 and EA-4/02 M a part of CMC and it is the lowest value of the respective uncertainty. If not stated otherwise, its coverage probability is approx. 95 %. If not stated otherwise, the uncertainty values stated without a unit are relative to the measured value. The uncertainty value stated herein is based on the best conditions achievable by the laboratory; the uncertainty value of a specific calibration may be higher depending on the conditions of such a calibration. For identical extreme values of adjacent ranges, the lower uncertainty value always applies.

[3] If the document identifying the calibration procedure is dated only these specific procedures are used. If the document identifying the calibration procedure is not dated, the latest edition of the specified procedure is used (including any changes).

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CMC for the field of measured quantity: Time and frequency quantities

Ord. number[1]	Calibrated quantity / Subject of calibration	Nominal range min	unit		max	unit	Parameter(s) of the measurand		Lowest stated expanded measurement uncertainty[2]	Calibration principle	Calibration procedure identification[3]	Location
1	Relative frequency deviation from f_0 (1; 5; 10) MHz / generators, reference oscillators frequency converters	0		to	1.10^{-7}				$2.5.10^{-10}$	Measurement of frequency deviation by a frequency comparator	KP 05/2019	
		1.10^{-7}		to	1.10^{-6}				$1.2.10^{-9}$			
2	Frequency f/lf generators, hf generators, calibrators, reference oscillators	0.1	Hz	to	100	Hz			3.10^{-4}/f	Frequency measurement using a counter	KP 09/2019	
		100	Hz	to	1	kHz			6.10^{-4}/f			
		1	kHz	to	1.5	GHz			6.10^{-7}			
		1.5	GHz	to	12	GHz			2.10^{-6}	Frequency measurement using a counter	KP 15/2019	
	Oscilloscopes	0.1	Hz	to	100	Hz			3.10^{-4}/f	Comparison with a counter	KP 14/2019	
		100	Hz	to	1	kHz			6.10^{-4}/f			
		1	kHz	to	1.5	GHz			6.10^{-7}			
	Frequency meters	1.5	GHz	to	12	GHz			2.10^{-6}	Frequency generation by a reference generator	KP 16/2019	
3	Pulse rise time / oscilloscopes			≥	3.5	ns			0.80 ns	Rise time generation by a pulse generator	KP 14/2019	
4	Inspection equipment, meters of circuit breaker tripping times	10	ms	to	100	ms			0.69 ms	Tripping time generation by a calibrator	KP 18 /2019	
		100	ms	to	1000	ms			0.85 ms			

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[3] If the document identifying the calibration procedure is dated only these specific procedures are used. If the document identifying the calibration procedure is not dated, the latest edition of the specified procedure is used (including any changes).

"This document is an appendix to the certificate of accreditation. In case of any discrepancies between the English and Czech versions, the Czech version shall prevail, both for the certificate appendix and the certificate itself. "