

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

VÍTKOVICE TESTING CENTER s. r. o.
Metrological Inspection Centre
Ruská 2887/101, 703 00 Ostrava - Vítkovice

Calibration laboratory locations:

1. Metrological Inspection Centre II Ruská 2887/101, 703 00 Ostrava – Vítkovice
2. Metrological Inspection Centre I Kotkova 431/4a, 703 00 Ostrava – Vítkovice
(vstup 58, Ruská ul.)

1. Metrological Inspection Centre II

Field of measured quantity: **length**

Calibration: Nominal calibration temperature: $(20 \pm 2) ^\circ\text{C}$

Ordinal number ¹⁾	Measured quantity	Measured quantity range	Calibration and Measurement Capability $[\pm] ^{2)}$	Calibration procedure identification
1.*	Calibration of length gauges and rules of measuring instruments by laser interferometer	(0 to 6,000) mm	$(0.14 + 0.8.L) \mu\text{m}$	CI-300.25-015
2.*	Calibration of length gauges and measuring instruments by steel parallels	(0 to 100) mm	$(0.20 + 1.0.L) \mu\text{m}$	CI-300.25-028
3.	Steel parallels	(0.5 to 100) mm	$(0.1 + 2.0.L) \mu\text{m}$	CI-300.25-020
4.	Steel parallels	(100 to 500) mm	$(0.3 + 3.8.L) \mu\text{m}$	CI-300.25-503
5.	Slide gauges - division 0.05 mm - division 0.02 mm - division 0.01 mm	(0 to 500) mm	$(30 + 1.L) \mu\text{m}$ $(13 + 1.L) \mu\text{m}$ $(8.5 + 1.L) \mu\text{m}$	CI-300.25-021
	Slide gauges - division 0.05 mm - division 0.02 mm - division 0.01 mm	(500 to 1,475) mm	$(31 + 2.L) \mu\text{m}$ $(16 + 2.L) \mu\text{m}$ $(13 + 2.L) \mu\text{m}$	
	Slide gauges - division 0.05 mm - division 0.02 mm - division 0.01 mm	(1,475 to 3,000) mm	$(32 + 5.L) \mu\text{m}$ $(20 + 6.L) \mu\text{m}$ $(13 + 8.L) \mu\text{m}$	
	Slide gauges - division 0.1 mm	(0 to 3,000) mm	$(60 + 1.L) \mu\text{m}$	
6.	Micrometer calliper gauges - division 0.01 mm - division 0.001 mm	(0 to 200) mm	$(2.5 + 1.8.L) \mu\text{m}$ $(0.9 + 2.L) \mu\text{m}$	CI-300.25-022

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Ordinal number ¹⁾	Measured quantity	Measured quantity range	Calibration and Measurement Capability [±] ²⁾	Calibration procedure identification
	Micrometer calliper gauges - division 0.01 mm - division 0.001 mm	(200 to 500) mm	(2.8 + 2.L) µm (1.0 + 3.L) µm	
	Micrometer calliper gauges - division 0.01 mm	(200 to 1,500) mm	(2.5 + 3.L) µm	
	Micrometer calliper gauges - division 0.01 mm	(1,500 to 3,000) mm	(3 + 7.L) µm	
7.	Thickness gauges with dial indicator - division 0.1 mm - division 0.01 mm - division 0.001 mm	(0 to 400) mm	30 µm 4.5 µm 3.4 µm	CI-300.25-027
8.	Inside micrometer gauges - division 0.01 mm - division 0.001 mm	(20 to 1,000) mm	(2.3 + 2.L) µm (1.2 + 2.5.L) µm	CI-300.25-023
	Inside micrometer gauges - division 0.01 mm - division 0.001 mm	(20 to 5,000) mm	(2.7 + 7.L) µm (1.6 + 6.L) µm	
9.	Rigid check gauges and gauges with mounting	(25 to 1,000) mm (1,000 to 2,000) mm	(0.3 + 2.L) µm (0.7 + 8.L) µm	CI-300.25-030
10.	Limit gauges, smooth	(2 to 250) mm	(0.5 + 3.L) µm	CI-300.25-043
11.	Feeler gauges	(0.01 to 2) mm	(1.3 + 1.L) µm	CI-300.25-131
12.	Thread gauges – male	(2 to 200) mm	2.4 µm	CI-300.25-127
	Thread gauges – female	(16 to 130)) mm	2.5 µm	
13.	Dial indicators - division 0.001 mm - division 0.01 mm - division 0.1 mm	(0 to 50) mm	0.48 µm 2.4 µm 29 µm	CI-300.25-046
14.	Hardness stylus instruments - Ra - Rz - RzISO - Rmax	(0.1 to 800) µm	3.5 % MV 4.3 % MV 4.5 % MV 4.4 % MV	CI-300.25-034

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	- Rt - Pt		4.4 % MV 2.4 % MV	
	Hardness standards - Ra - Rz - RzISO - Rmax - Rt	(0.1 to 800) µm	5.2 % MV 5.5 % MV 5.5 % MV 5.5 % MV 5.6 % MV	
15.	Steel rules	(0 to 3) m	(41 + 31.L) µm	CI-300.25-004
	Wooden rules	(0 to 3) m	(53 + 30.L) µm	
	Tape measures - division 1 mm	(0 to 10) m	(260 + 2.L) µm	
16.	Steel gauges, accuracy class 1	(0 to 5,000) mm	(10 + 1.L) µm	CI-300.25-130
17.	Tape measures	(0 to 50) m	(90 + 10.L) µm	CI-300.25-024
18.	Micrometer depth gauges - division 0.01 mm - division 0.001 mm	(0 to 300) mm	(2.9 + 5.L) µm (0.8 + 6.L) µm	CI-300.25-506
	Depth gauges with dial indicator - division 0.01 mm	(0 to 300) mm	(11.6 + 0.6.L) µm	
19.	Inside micrometer calliper - division 0.01 mm	(100 to 500) mm	(2.5 + 3.L) µm	CI-300.25-126
	Inside micrometer - division 0.01 mm	(3 to 200) mm	(3.8 + 1.L) µm	
	Inside micrometer - division 0.01 mm - division 0.001 mm	(200 to 300) mm	(4 + 2.5.L) µm (2.4 + 1.L) µm	
	Internal gauge with measuring arms – digital - division 0.01 mm	(2.5 to 200) mm	(12.2 + 1.L) µm	
	Internal gauge with measuring arms –with dial indicator - division 0.001 mm	(2.5 to 200) mm	(6.8 + 1.L) µm	
	Three-contact internal gauge	(2 to 200) mm		



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	- division 0.01 mm		(4 + 3.L) μ m	
	- division 0.001 mm		(2.8 + 2.L) μ m	
20.	Weld gauges - division 0.1 mm - division 0.2 mm - division 0.05 mm	(0 to 100) mm	24 μ m 58 μ m 10 μ m	CI-300.25-084
21.	Instruments for thickness measurement of surface layers	(0 to 5,000) mm	(2.2 + 2.2.1) μ m	CI-300.25-087
	Calibration foils	(0 to 5,000) mm	(0.4 + 0.6.1) μ m	
22.*	Surface/ layout plates	(250 to 4,000) mm	2M μ m	CI-300.25-048
23.	Pasameters and micropasameters	(0 to 300) mm	(1.4 + 1.L) μ m	CI-300.25-510
24.	Thread-measuring wires	(0.17 to 10) mm	(0.22 + 2.L) μ m	CI-300.25-504

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

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

Explanations:

CI -300... Internal Calibration Procedure

L ... Measured dimension in metres

l ... Measured dimension in millimetres

MV ... Measured Value

M ... Diagonal

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.	Length gauges and rules of measuring instruments - calibration by a laser interferometer
2.	Length gauges and measuring instruments - calibration by steel parallels
3.	Steel parallels 0.5 - 100 mm
4.	Steel parallels from 100 to 500 mm
5.	Slide gauges, depth slide gauges, height slide gauges
6.	Micrometer calliper gauges
7.	Thickness gauges with dial indicator
8.	Inside micrometer gauges



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Ordinal number	Measured instrument/device type
9.	Rigid check gauges and gauges with mounting
10.	Limit gauges, smooth
11.	Feeler gauges
12.	Thread gauges - male, thread gauges - female
13.	Dial indicators
14.	Hardness stylus instruments, hardness standards
15.	Steel and wooden rules, tape measures
16.	Steel gauges, accuracy class 1
17.	Tape measures
18.	Micrometer depth gauges
19.	Internal gauges
20.	Weld gauges
21.	Instruments for thickness measurement of surface layers
22.	Surface/ layout plates
23.	Pasameters and micropasameters
24.	Thread-measuring wires



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Field of measured quantity:

Plane angle

Calibration:

Nominal calibration temperature: $(20 \pm 2) ^\circ\text{C}$

Ordinal number	Measured quantity	Measured quantity range	Calibration and Measurement Capability $[\pm] ^1$	Calibration procedure identification
1.	Mechanical angle gauges - division 60' - division 30' - division 10' - division 5' - division 1'	(0 to 180) °	40' 20' 8.8' 4.4' 0.9'	CI-300.25-025
	Optical and digital angle gauges - division 10' - division 5' - division 1'	(0 to 360) °	8.8' 4.4' 0.9'	
2.	Flat and trying squares, check	(32 to 400) mm	$(5.7 + 1.4.L) \mu\text{m} / \text{X}$	CI-300.25-026
	Flat and trying squares, fitter's	(32 to 400) mm	$(7.4 + 1.2.L) \mu\text{m} / \text{X}$	
	Angles with angle 120°	(32 to 160) mm	11 $\mu\text{m} / 160 \text{ mm}$	
	Knife angles	(32 to 160) mm	$(5.2 + 1.2.L) \mu\text{m}$	
3.	Longitudinal levels - (50 to 500) mm	(0.01 to 0.05) mm / 1,000 mm	1/3 division of the scale / 1 m	CI-300.25-119
4.	Frame levels - (100 to 300) mm	(0.01 to 0.05) mm / 1,000 mm	1/3 division of the scale / 1 m	CI-300.25-123
5.	Longitudinal levels - (100 to 1,000) mm	0.5 mm / 1 m and lower accuracy	150 $\mu\text{m} / 1 \text{ m}$	CI-300.25-501

¹⁾ Expressed like uncertainty in accordance with the requirements of the document EA 4/02 at $k = 2$.

Explanations:

CI -300... Internal Calibration Procedure

L ... Measured dimension in metres

X ... Related to the longer side of the angle

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.	Angle gauges – mechanical, optical, digital

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Ordinal number	Measured instrument/device type
2.	Flat, trying squares, knife angles, flat knife squares, trying knife squares with wide base
3.	Longitudinal levels
4.	Frame levels
5.	Calibration of longitudinal levels with accuracy 0.5 mm / 1 m and lower, digital



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Field of measured quantity: force, torque

Calibration:

Nominal calibration temperature: $(22 \pm 3) ^\circ\text{C}$

Ordinal number	Measured quantity	Measured quantity range	Calibration and Measurement Capability [±] ¹⁾	Calibration procedure identification
1.	Torque wrenches and screwdrivers	(0.2 to 10) Nm	1 % MV	CI-KMS I-41
		(8 to 30) Nm		
	Torque wrenches and screwdrivers	(20 to 500) Nm	0.7 % MV	
		(100 to 1,000) Nm		
		(250 to 5,000) Nm		

¹⁾ Expressed like uncertainty in accordance with the requirements of the document EA 4/02 at $k = 2$.

Explanations:

CI-KMS ... Internal Calibration Procedure

MV ... Measured Value

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.	Torque wrenches and screwdrivers



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Field of measured quantity: **hardness**

Calibration: Nominal calibration temperature: $(23 \pm 5) ^\circ\text{C}$

Ordinal number	Measured quantity	Measured quantity range	Calibration and Measurement Capability $[\pm]$ ¹⁾	Calibration procedure identification
1.	Portable hardness testers			CI-300.25-051
	- Vickers	(80 to 800) HV	1.6 % MV	
	- Brinell	(80 to 660) HBW	1.6 % MV	
	- Rockwell	(20 to 70) HRC	1.6 % MV	
	- Leeb	(350 to 850) HLD	1.6 % MV	

¹⁾ Expressed like uncertainty in accordance with the requirements of the document EA 4/02 at $k = 2$.

Explanations:

CI -300... Internal Calibration Procedure

MV ... Measured Value

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.	Portable metal hardness testers



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2. Metrological Inspection Centre I

Measured quantity field: pressure

Calibration:

Nominal calibration temperature: $(20 \pm 2) ^\circ\text{C}$

Ordinal number	Measured quantity	Measured quantity range	Calibration and Measurement Capability [$\pm$] ¹⁾	Calibration procedure identification
1.	Overpressure – gaseous medium	(0 to 30) kPa	12 Pa	CI-KMS I-21
		(30 to 100) kPa	36 Pa	CI-KMS I-22
		(0.1 to 2) MPa	4.2 kPa	
2.	Overpressure – liquid medium	(0.025 to 0.6) MPa	0.18 kPa	CI-KMS I-21
		(0.6 to 6) MPa	0.03 % MV	CI-KMS I-22
		(6 to 400) MPa	0.05 % MV	

¹⁾ Expressed like uncertainty in accordance with the requirements of the document EA 4/02 at $k = 2$.

Explanations:

CI-KMS ... Internal Calibration Procedure

MV ... Measured Value

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.	Deformation manometers, electromechanical manometers (pressure sensors and transducers, digital manometers)
2.	Deformation manometers, electromechanical manometers (pressure sensors and transducers, digital manometers)



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Measured quantity field: temperature

Calibration:

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

Ordinal number	Measured quantity	Measured quantity range	Calibration and Measurement Capability $[\pm] ^1$	Calibration procedure identification
1.	Resistance temperature sensors	$0 ^\circ\text{C}$	$0.04 ^\circ\text{C}$	CI-KMS I-01
		$(50 \text{ to } 200) ^\circ\text{C}$	$0.15 ^\circ\text{C}$	
		$(200 \text{ to } 400) ^\circ\text{C}$	$0.6 ^\circ\text{C}$	
2.	Thermocouple sensors temperature	$0 ^\circ\text{C}$	$0.7 ^\circ\text{C}$	CI-KMS I-02
		$(50 \text{ to } 200) ^\circ\text{C}$	$0.7 ^\circ\text{C}$	
		$(200 \text{ to } 400) ^\circ\text{C}$	$1.0 ^\circ\text{C}$	
		$(400 \text{ to } 1,100) ^\circ\text{C}$	$1.7 ^\circ\text{C}$	
		$(1,100 \text{ to } 1,500) ^\circ\text{C}$	$3.0 ^\circ\text{C}$	
3.	Radiation thermometers (pyrometers)	$(50 \text{ to } 100) ^\circ\text{C}$	$1.7 ^\circ\text{C}$	CI-KMS I-04
		$(100 \text{ to } 400) ^\circ\text{C}$	$3.7 ^\circ\text{C}$	
		$(400 \text{ to } 1,500) ^\circ\text{C}$	$4.0 ^\circ\text{C}$	
4.	Direct-indicating thermometers	$(30 \text{ to } 500) ^\circ\text{C}$	$1.9 ^\circ\text{C}$	CI-KMS I-03

¹⁾ Expressed like uncertainty in accordance with the requirements of the document EA 4/02 at $k = 2$.

Explanations:

CI-KMS ... Internal Calibration Procedure

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.	Resistance temperature sensors, resistance temperature sensors with a transducer
2.	Thermoelectric temperature sensors, thermoelectric temperature sensors with a transducer
3.	Radiation thermometers (pyrometers)
4.	Direct-indicating thermometers



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Field of measured quantity: electrical quantities

Calibration:

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

Ordinal number ¹⁾	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability $[\pm] ^{2)}$	Calibration procedure identification
1.	DC voltage (generation)			CI-KMS I-11 CI-KMS I-12 CI-KMS I-13 CI-KMS I-14 CI-KMS I-17
	(0 to 20) mV		2.7 μV	
	(20 to 50) mV		3.3 μV	
	(50 to 100) mV		4.1 μV	
	(100 to 200) mV		5.9 μV	
	(0.2 to 0.5) V		8.7 μV	
	(0.5 to 1) V		14 μV	
	(1 to 2) V		25 μV	
	(2 to 5) V		76 μV	
	(5 to 10) V		0.13 mV	
	(10 to 20) V		0.22 mV	
	(20 to 50) V		1.0 mV	
	(50 to 100) V		1.7 mV	
	(100 to 200) V		3.2 mV	
	(200 to 500) V		10 mV	
	(500 to 1,000) V		18 mV	
	(1,000 to 1,100) V		81 mV	
2.	AC voltage (generation)			CI-KMS I-11 CI-KMS I-12 CI-KMS I-13 CI-KMS I-17
	(1 to 10) mV	10 Hz to 44 Hz	28 μV	
		45 Hz to 1 kHz	21 μV	
		1 kHz to 20 kHz	43 μV	
		20 kHz to 100 kHz	68 μV	
	(10 to 20) mV	10 Hz to 44 Hz	37 μV	
		45 Hz to 1 kHz	23 μV	
		1 kHz to 20 kHz	45 μV	
		20 kHz to 100 kHz	78 μV	
	(20 to 50) mV	10 Hz to 44 Hz	67 μV	
		45 Hz to 1 kHz	33 μV	
		1 kHz to 20 kHz	60 μV	
		20 kHz to 100 kHz	0.14 mV	
	(50 to 100) mV	10 Hz to 44 Hz	0.12 mV	
		45 Hz to 1 kHz	41 μV	

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		1 kHz to 20 kHz	69 µV	
		20 kHz to 100 kHz	0.19 mV	
	(100 to 200) mV	10 Hz to 44 Hz	0.21 mV	
		45 Hz to 1 kHz	64 µV	
		1 kHz to 20 kHz	0.11 mV	
		20 kHz to 100 kHz	0.33 mV	
	(0.2 to 0.5) V	10 Hz to 44 Hz	0.52 mV	
		45 Hz to 1 kHz	0.26 mV	
		1 kHz to 20 kHz	0.78 mV	
		20 kHz to 100 kHz	1.0 mV	
	(0.5 to 1) V	10 Hz to 44 Hz	0.80 mV	
		45 Hz to 1 kHz	0.34 mV	
		1 kHz to 20 kHz	0.84 mV	
		20 kHz to 100 kHz	1.3 mV	
	(1 to 2) V	10 Hz to 44 Hz	1.4 mV	
		45 Hz to 1 kHz	0.55 mV	
		1 kHz to 20 kHz	1.4 mV	
		20 kHz to 100 kHz	2.2 mV	
	(2 to 5) V	10 Hz to 44 Hz	4.9 mV	
		45 Hz to 1 kHz	2.4 mV	
		1 kHz to 20 kHz	3.9 mV	
		20 kHz to 100 kHz	9.9 mV	
	(5 to 10) V	10 Hz to 44 Hz	7.8 mV	
		45 Hz to 1 kHz	3.2 mV	
		1 kHz to 20 kHz	5.0 mV	
		20 kHz to 100 kHz	13 mV	
	(10 to 20) V	10 Hz to 44 Hz	14 mV	
		45 Hz to 1 kHz	5.2 mV	
		1 kHz to 20 kHz	8.0 mV	
		20 kHz to 100 kHz	21 mV	
	(20 to 50) V	30 Hz to 44 Hz	54 mV	
		45 Hz to 1 kHz	26 mV	
		1 kHz to 10 kHz	32 mV	
		10 kHz to 40 kHz	58 mV	
	(50 to 100) V	30 Hz to 44 Hz	82 mV	
		45 Hz to 1 kHz	34 mV	

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Ordinal number ¹⁾	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [±] ²⁾	Calibration procedure identification
	(100 to 200) V	1 kHz to 10 kHz	43 mV	
		10 kHz to 40 kHz	74 mV	
		30 Hz to 44 Hz	0.14 V	
		45 Hz to 1 kHz	53 V	
	(200 to 500) V	1 kHz to 10 kHz	68 V	
		10 kHz to 40 kHz	0.12 V	
		30 Hz to 44 Hz	0.58 V	
		45 Hz to 1 kHz	0.24 V	
	(500 to 1,000) V	1 kHz to 10 kHz	0.32 V	
		30 Hz to 44 Hz	0.90 V	
		45 Hz to 1 kHz	0.44 V	
	(1,000 to 1,100) V	1 kHz to 10 kHz	0.54 V	
3.	Direct current (generation)			CI-KMS I-11
	(0 to 100) µA			CI-KMS I-12
	(100 to 200) µA		24 nA	CI-KMS I-13
	(0.2 to 0.5) mA		35 nA	CI-KMS I-14
	(0.5 to 1) mA		64 nA	CI-KMS I-16
	(1 to 2) mA		94 nA	CI-KMS I-17
	(2 to 5) mA		0.16 µA	
	(5 to 10) mA		0.52 µA	
	(10 to 20) mA		0.83 µA	
	(20 to 50) mA		1.5 µA	
	(50 to 100) mA		6.0 µA	
	(100 to 200) mA		8.6 µA	
	(0.2 to 0.5) A		15 µA	
	(0.5 to 1) A		0.12 mA	
	(1 to 2) A		0.19 mA	
	(2 to 5) A		0.35 mA	
	(5 to 10) A		2.3 mA	
	(10 to 20) A		3.9 mA	
	(20 to 30) A		7.5 mA	
	Using current coils (30 to 1,500) A		18 mA	
			1 %	CI-KMS I-16



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VÍTKOVICE TESTING CENTER s. r. o.
Metrological Inspection Centre
Ruská 2887/101, 703 00 Ostrava - Vítkovice

Ordinal number ¹⁾	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [$\pm$] ²⁾	Calibration procedure identification
4.	Alternating current (generation)			CI-KMS I-11 CI-KMS I-12
	(20 to 50) μ A	10 Hz to 44 Hz	0.41 μ A	CI-KMS I-13
		45 Hz to 1 kHz	0.22 μ A	CI-KMS I-16
		1 kHz to 10 kHz	0.76 μ A	CI-KMS I-17
	(50 to 100) μ A	10 Hz to 44 Hz	0.53 μ A	
		45 Hz to 1 kHz	0.26 μ A	
		1 kHz to 10 kHz	1.3 μ A	
	(100 to 200) μ A	10 Hz to 44 Hz	0.76 μ A	
		45 Hz to 1 kHz	0.35 μ A	
		1 kHz to 10 kHz	2.2 μ A	
	(0.2 to 0.5) mA	10 Hz to 44 Hz	1.5 μ A	
		45 Hz to 1 kHz	0.66 μ A	
		1 kHz to 10 kHz	3.3 μ A	
	(0.5 to 1) mA	10 Hz to 44 Hz	2.7 μ A	
		45 Hz to 1 kHz	0.98 μ A	
		1 kHz to 10 kHz	6.2 μ A	
	(1 to 2) mA	10 Hz to 44 Hz	5.0 μ A	
		45 Hz to 1 kHz	1.7 μ A	
		1 kHz to 10 kHz	12 μ A	
	(2 to 5) mA	10 Hz to 44 Hz	16 μ A	
		45 Hz to 1 kHz	5.4 μ A	
		1 kHz to 10 kHz	19 μ A	
	(5 to 10) mA	10 Hz to 44 Hz	27 μ A	
		45 Hz to 1 kHz	7.5 μ A	
		1 kHz to 10 kHz	33 μ A	
	(10 to 20) mA	10 Hz to 44 Hz	50 μ A	
		45 Hz to 1 kHz	13 μ A	
		1 kHz to 10 kHz	62 μ A	
	(20 to 50) mA	10 Hz to 44 Hz	0.16 mA	
		45 Hz to 1 kHz	54 μ A	
		1 kHz to 10 kHz	0.34 mA	
	(50 to 100) mA	10 Hz to 44 Hz	0.27 mA	
		45 Hz to 1 kHz	76 μ A	
		1 kHz to 10 kHz	0.63 mA	
	(100 to 200) mA	10 Hz to 44 Hz	0.50 mA	

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		45 Hz to 1 kHz	0.13 mA	
		1 kHz to 10 kHz	1.2 mA	
	(0.2 to 0.5) A	10 Hz to 44 Hz	1.6 mA	
		45 Hz to 1 kHz	0.76 mA	
		1 kHz to 10 kHz	3.4 mA	
		10 Hz to 44 Hz	2.7 mA	
		45 Hz to 1 kHz	1.1 mA	
	(0.5 to 1) A	1 kHz to 10 kHz	6.3 mA	
		10 Hz to 44 Hz	5.1 mA	
		45 Hz to 1 kHz	1.9 mA	
	(1 to 2) A	1 kHz to 10 kHz	12 mA	
		30 Hz to 44 Hz	16 mA	
		45 Hz to 100 Hz	8.7 mA	
	(2 to 5) A	100 Hz to 1 kHz	23 mA	
		30 Hz to 44 Hz	27 mA	
		45 Hz to 100 Hz	13 mA	
	(5 to 10) A	100 Hz to 1 kHz	40 mA	
		30 Hz to 44 Hz	51 mA	
		45 Hz to 100 Hz	23 mA	
	(10 to 20) A	100 Hz to 1 kHz	75 mA	
		30 Hz to 44 Hz	75 mA	
		45 Hz to 100 Hz	32 mA	
	(20 to 30) A	100 Hz to 1 kHz	0.11 A	
		30 Hz to 60 Hz	1.0 %	
		Using current coils (30 to 1,500) A		CI-KMS I-16
5.	DC resistance (generation)			CI-KMS I-11
	0.1 m Ω		0.020 %	CI-KMS I-12
	1 m Ω		0.025 %	CI-KMS I-13
	0.01 Ω		0.010 %	CI-KMS I-14
	0.1 Ω ; 1 Ω ; 10 Ω		0.015 %	CI-KMS I-17
	100 Ω ; 1 k Ω ; 100 k Ω		0.010 %	
	10 k Ω		0.060 %	
	100 m Ω to 4.99 Ω		0.30 % + 10 m Ω	
	5 Ω to 100 Ω		0.20 % + 10 m Ω	
	100 Ω to 10 M Ω		0.10 %	

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Ordinal number ¹⁾	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [±] ²⁾	Calibration procedure identification
	10 MΩ to 999.9 MΩ		0.50 %	
	1 GΩ to 10 GΩ		1.0 %	
	100 GΩ		3.0 %	
6.	DC voltage (measurement)			CI-KMS I-12 CI-KMS I-14
	(0 to 50) mV		6.4 μV	
	(50 to 100) mV		8.5 μV	
	(0.1 to 0.5) V		24 μV	
	(0.5 to 1) V		38 μV	
	(1 to 5) V		0.20 mV	
	(5 to 10) V		0.35 mV	
	(10 to 50) V		3.0 mV	
	(50 to 100) V		5.2 mV	
	(100 to 500) V		36 mV	
	(500 to 1,000) V		60 mV	
7.	AC voltage (measurement)			CI-KMS I-12
	(1 to 50) mV		89 μV	CI-KMS I-17
			20 kHz to 50 kHz	0.13 mV
			50 kHz to 100 kHz	0.45 mV
	(50 to 100) mV		10 Hz to 20 kHz	0.12 mV
			20 kHz to 50 kHz	0.20 mV
			50 kHz to 100 kHz	0.79 mV
	(0.1 to 0.5) V		10 Hz to 20 kHz	0.70 mV
			20 kHz to 50 kHz	1.3 mV
			50 kHz to 100 kHz	4.4 mV
	(0.5 to 1) V		10 Hz to 20 kHz	1.1 mV
			20 kHz to 50 kHz	2.0 mV
			50 kHz to 100 kHz	7.9 mV
	(1 to 5) V		10 Hz to 20 kHz	7.0 mV
			20 kHz to 50 kHz	13 mV
			50 kHz to 100 kHz	44 mV
	(5 to 10) V		10 Hz to 20 kHz	11 mV
			20 kHz to 50 kHz	20 mV
			50 kHz to 100 kHz	79 mV

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Ordinal number ¹⁾	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [±] ²⁾	Calibration procedure identification
	(10 to 50) V	10 Hz to 20 kHz	70 mV	
		20 kHz to 50 kHz	0.13 V	
		50 kHz to 100 kHz	0.44 V	
	(50 to 100) V	10 Hz to 20 kHz	0.11 V	
		20 kHz to 50 kHz	0.20 V	
		50 kHz to 100 kHz	0.80 V	
	(100 to 500) V	10 Hz to 20 kHz	0.63 V	
	(500 to 1,000) V	10 Hz to 20 kHz	1.3 V	
	(100 to 750) V	20 kHz to 50 kHz	1.5 V	
8.	Direct current (measurement)			CI-KMS I-12 CI-KMS I-14
	(0 to 50) µA		59 nA	
	(50 to 100) µA		88 nA	
	(0.1 to 0.5) mA		0.35 µA	
	(0.5 to 1) mA		0.64 µA	
	(1 to 5) mA		5.3 µA	
	(5 to 10) mA		8.2 µA	
	(10 to 50) mA		35 µA	
	(50 to 100) mA		64 µA	
	(100 to 200) mA		0.15 mA	
	(200 to 400) mA		0.26 mA	
	(0.4 to 0.5) A		0.54 mA	
	(0.5 to 1) A		0.82 mA	
	(1 to 1.5) A		2.9 mA	
	(1.5 to 3) A		4.5 mA	
	(3 to 5) A		11 mA	
	(5 to 10) A		19 mA	
9.	Alternating current (measurement)			CI-KMS I-12
	(5 to 50) µA	10 Hz to 5 kHz	0.16 µA	
		5 kHz to 10 kHz	0.33 µA	
	(50 to 100) µA	10 Hz to 5 kHz	0.25 µA	
		5 kHz to 10 kHz	0.52 µA	
	(0.1 to 0.5) mA	10 Hz to 5 kHz	1.1 µA	
		5 kHz to 10 kHz	4.5 µA	

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	(0.5 to 1) mA	10 Hz to 5 kHz	1.7 μ A	
		5 kHz to 10 kHz	5.5 μ A	
	(1 to 5) mA	10 Hz to 5 kHz	16 μ A	
		5 kHz to 10 kHz	0.11 mA	
	(5 to 10) mA	10 Hz to 5 kHz	25 μ A	
		5 kHz to 10 kHz	0.12 mA	
	(10 to 50) mA	10 Hz to 5 kHz	0.11 mA	
		5 kHz to 10 kHz	0.43 mA	
	(50 to 100) mA	10 Hz to 5 kHz	0.17mA	
		5 kHz to 10 kHz	0.54 mA	
	(100 to 200) mA	10 Hz to 5 kHz	0.75 mA	
		5 kHz to 10 kHz	4.8 mA	
	(200 to 400) mA	10 Hz to 5 kHz	0.96 mA	
		5 kHz to 10 kHz	5.1 mA	
	(0.4 to 0.5) A	10 Hz to 5 kHz	1.2 mA	
		5 kHz to 10 kHz	12 mA	
	(0.5 to 1) A	10 Hz to 5 kHz	1.7 mA	
		5 kHz to 10 kHz	13 mA	
	(1 to 1.5) A	10 Hz to 5 kHz	5.7 mA	
		5 kHz to 10 kHz	33 mA	
	(1.5 to 3) A	10 Hz to 5 kHz	8.0 mA	
		5 kHz to 10 kHz	39 mA	
	(3 to 5) A	10 Hz to 5 kHz	19 mA	
		5 kHz to 10 kHz	0.11 mA	
	(5 to 10) A	10 Hz to 5 kHz	27 mA	
		5 kHz to 10 kHz	0.13 A	
10.	DC resistance (measurement)			CI-KMS I-12
	0 Ω		0.13 m Ω	CI-KMS I-14
	(0 to 5) Ω		4.1 m Ω	CI-KMS I-15
	(5 to 10) Ω		4.7 m Ω	
	(10 to 50) Ω		11 m Ω	
	(50 to 100) Ω		17 m Ω	
	(100 to 500) Ω		70 m Ω	

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	(500 to 1,000) Ω		0.13 Ω	
	(1 to 5) kΩ		0.70 Ω	
	(5 to 10) kΩ		1.3 Ω	
	(10 to 50) kΩ		7.1 Ω	
	(50 to 100) kΩ		13 Ω	
	(0.1 to 0.5) MΩ		73 Ω	
	(0.5 to 1) MΩ		0.13 kΩ	
	(1 to 5) MΩ		2.5 kΩ	
	(5 to 10) MΩ		4.8 kΩ	
	(10 to 50) MΩ		0.48 MΩ	
	(50 to 100) MΩ		0.94 MΩ	
	(0.1 to 1) GΩ		24 MΩ	
11.*	Simulation and measurement of transducer output signals			CI-KMS I-11 CI-KMS I-12 CI-KMS I-14
	Direct current (simulation) (0 to 25) mA		0.020 % + 1.5 μA	
	DC voltage (simulation) (– 3 to + 12) V		0.020 % + 0.1 mV	
	Direct current (measurement) (– 100 to + 100) mA		0.020 % + 1.5 μA	
	DC voltage (measurement) (– 1 to + 1) V (1 to 60) V		0.020 % + 5 μV 0.02 % + 0.25 mV	
	Simulation and measurement of mV (T/C terminals) (– 25 to + 150) mV		0.020 % + 4 μV	
	Resistance (simulation) (0 to 4,000) Ω		0.040 % + 30 mΩ	
	DC Resistance (measurement) (0 to 4,000) Ω		0.020 % + 3.5 mΩ	

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Ordinal number ¹⁾	Measured quantity and range of measurement	Frequency	Calibration and Measurement Capability [±] ²⁾	Calibration procedure identification
	Calibration of temperature measuring chains by simulating electrical signal			CI-KMS I-14
	Thermocouples (simulation and measurement)			
	Type K (– 200 to + 1,000) °C (1,000 to 1,372) °C			
	Type J (– 210 to + 1,200) °C			
	Type N (– 200 to + 1,300) °C			
	Type S (– 50 to 0) °C (0 to 1,768) °C			
	Type B (400 to 1,820) °C			
	Platinum resistance temperature sensors			
	Measurement			
	(– 200 to + 200) °C			
	(200 to 600) °C			
	(600 to 850) °C			
	Simulation			
	(– 200 to + 200) °C			
	(200 to 600) °C			
	(600 to 850) °C			
12.	Quantities measured or generated by digital electrical inspection equipment			CI-KMS I-17
	Insulation resistors (generation)			
	(10 to 999.9) kΩ			
	(1 to 9.999) MΩ			
	(10 to 999.9) MΩ			
	(1 to 10) GΩ			
	100 GΩ			

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	Earth connection resistance, loop / network impedance			
	25 mΩ, 50 mΩ, 100 mΩ		5.0 mΩ	
	330 mΩ		7.0 mΩ	
	500 mΩ		8.0 mΩ	
	1 Ω		10 mΩ	
	1.8 Ω		18 mΩ	
	5 Ω		30 mΩ	
	10 Ω		60 mΩ	
	18 Ω		0.1 Ω	
	50 Ω		0.3 Ω	
	100 Ω		0.5 Ω	
	180 Ω		1.0 Ω	
	500 Ω		2.5 Ω	
	1 kΩ		5.0 Ω	
	1.8 kΩ		10 Ω	
	Leakage current			
	0.1 mA to 30 mA	50 Hz	0.30 % + 2 µA	
	Residual current circuit breakers	50 Hz		
	Breaking current			
	Mode 0.5 x I and 1 x I (3 to 3,000) mA		1.0 %	
	Mode 1.4 x I and 2 x I (3 to 1,500) mA		2.0 %	
	Mode 5 x I (3 to 600) mA		5.0 %	
	Breaking time			
	(10 to 5,000) ms		0.020 % + 0.25 ms	
	Contact voltage			
	(0 to 250) V		5.0 % + 3 V	
	Multimeter (measurement)			CI-KMS I-12
	Direct-current voltage			CI-KMS I-13
	(100 to 1,100) V		0.20 % + 0.55 V	CI-KMS I-17
	Alternating-current voltage			
	(100 to 1,100) V	20 Hz to 2 kHz	0.20 % + 0.55 V	

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	Direct current			
	(3 to 30) A		0.35 % + 15 mA	
	Alternating current	20 Hz to 400 Hz		
	(3 to 30) A		0.35 % + 15 mA	
	10 kV Adapter to 5320A			
	0 V to 10 kV	DC	0.30 % + 5 V	
	0 V to 10 kV peak	50 Hz to 60 Hz	0.50 % + 5 V	
	High voltage probe			
	0 V to 20 kV	DC	0.50 % + 10 V	
	0 V to 20 kV	50 Hz to 60 Hz	0.50 % + 10 V	
13.	Ultrasonic defectoscopes (measurement and generation)			CI-KMS I-18
	Stability (instability) - measurement of amplitude			
	(1 to 100) % SH		1.7 % MV	
	Stability (instability) - measurement of position			
	(1 to 100) % SW		1.3 % MV	
	Measurement of transmitting pulse voltage and tail			
	(1 to 500) V		4.2 % MV	
	Measurement of transmitting pulse rise time and duration			
	(1 to 500) ns		4.2 % MV	
	Receiver frequency	0.2 MHz to 20 MHz		
	Upper and lower limit frequency		3.3 % MV	
	Medium frequency		4.7 % CV	
	Bandwidth		4.7 % CV	
	Equivalent input noise	0.2 MHz to 20 MHz		
	<100 V/		4.2 % CV	
	Attenuator accuracy			
	(1 to 100) dB		2.0 % SV	

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	Display unit vertical linearity (1 to 100) dB	0.2 MHz to 20 MHz	2.0 % SV	

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

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

Explanations:

CI-KMS ... Internal Calibration Procedure

SH... Screen Height

SW... Screen Width

MV ... Measured Value

SV... Set Value

CV... Calculated Value

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.	DC and AC voltmeters, analogue and digital
2.	DC and AC ammeters, analogue and digital
3.	Analogue and digital ohmmeters
4.	Analogue and digital multimeters
5.	Tong-test ammeters
6.	Inspection equipment
7.	DC resistance gauges
8.	DC resistance boxes
9.	Electrical parts of thermometers and temperature simulation systems, controllers, processing and display units
10.	Ultrasonic defectoscopes

