



SCS Directory

Accreditation number: SCS 0115

International standard: ISO/IEC 17025:2005
Swiss standard: SN EN ISO/IEC 17025:2005

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Initial accreditation: 02.06.2009
Current accreditation: 02.06.2014 to 01.06.2019
Scope of accreditation see: www.sas.admin.ch
(Accredited bodies)

Scope of accreditation as of 28.06.2017

Calibration laboratory for length, form, torque and electrical quantities

Calibration and Measurement Capability (CMC)

Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement Capability \pm ¹⁾	Remarks
Length		Also available ON-SITE with bigger uncertainty.		
Calipers	Up to 1000 mm	Scale interval		
		0,1 mm	$58 \mu\text{m} + 2 \cdot 10^{-6} \cdot L$	Analog indication
		0,02 mm	$12 \mu\text{m} + 12 \cdot 10^{-6} \cdot L$	
		0,01 mm	$8 \mu\text{m} + 7 \cdot 10^{-6} \cdot L$	
		0,05 mm	$29 \mu\text{m} + 3 \cdot 10^{-6} \cdot L$	
		0,01 mm	$13 \mu\text{m} + 5 \cdot 10^{-6} \cdot L$	Digital indication
		0,001 mm	$6 \mu\text{m} + 8 \cdot 10^{-6} \cdot L$	



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Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement Capability \pm ¹⁾	Remarks
Dial gauges		Also available ON-SITE with bigger uncertainty.		
		Scale interval		
	0 - 10 mm	0,001 mm	0,6 μ m	Analog indication
	0 - 20 mm	0,002 mm	1,2 μ m	
	0 - 100 mm	0,01 mm	5,8 μ m	
	0 - 100 mm	0,1 mm	58,1 μ m	
		0 - 2 mm	0,0001 mm	0,2 μ m
	0 - 10 mm	0,001 mm	1,2 μ m	
	0 - 100 mm	0,01 mm	11,9 μ m	
Dial Gauges (Lever-Type)		Also available ON-SITE with bigger uncertainty.		
		Scale interval		
		0,002 mm	1,2 μ m	Analog indication
		0,01 mm	6,5 μ m	
	0,001 mm	1,2 μ m	Digital indication	
	0,01 mm	11,9 μ m		
Electronic length indicators		Also available ON-SITE with bigger uncertainty.		
		Scale interval		
	0 - 2 mm	0,0001 mm	0,2 μ m	
	0 - 10 mm	0,0001 mm	0,6 μ m	
	0 - 30 mm	0,0001 mm	1,2 μ m	



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Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement Capability \pm ¹⁾	Remarks
External Micrometers	0 - 25 mm	Also available ON-SITE with bigger uncertainty.		
		Scale interval		
		0,001 mm	0,6 μm + 0,5 \cdot 10 ⁻⁶ ·L	Analog indication
		0,010 mm	5,8 μm	
	0 - 25 mm	0,001 mm	1,2 μm + 0,5 \cdot 10 ⁻⁶ ·L	Digital indication
		0,010 mm	11,6 μm	
	>25 - 125 mm	0,001 mm	0,6 μm + 1,2 \cdot 10 ⁻⁶ ·L	Analog indication
		0,010 mm	5,8 μm	
	>25 - 125 mm	0,001 mm	1,2 μm + 7,0 \cdot 10 ⁻⁶ ·L	Digital indication
		0,010 mm	11,6 μm	
	>125 - 200 mm	0,001 mm	0,6 μm + 11,0 \cdot 10 ⁻⁶ ·L	Analog indication
		0,010 mm	5,8 μm + 2,0 \cdot 10 ⁻⁶ ·L	
	>125 - 200 mm	0,001 mm	1,2 μm + 9,0 \cdot 10 ⁻⁶ ·L	Digital indication
		0,010 mm	11,6 μm	
	>200 - 300 mm	0,001 mm	0,3 μm + 4,0 \cdot 10 ⁻⁶ ·L	Analog indication
		0,010 mm	1,1 μm + 2,0 \cdot 10 ⁻⁶ ·L	
>200 - 300 mm	0,001 mm	1,2 μm + 11,0 \cdot 10 ⁻⁶ ·L	Digital indication	
	0,010 mm	11,5 μm + 0,5 \cdot 10 ⁻⁶ ·L		
Internal Micrometers 3-line contact	2 - 300 mm	Also available ON-SITE with bigger uncertainty.		
		Scale interval		
		0,001 mm	2,5 μm + 1,5 \cdot 10 ⁻⁶ ·L	Analog indication
		0,002 mm	2,6 μm + 2,0 \cdot 10 ⁻⁶ ·L	
		0,005 mm	3,8 μm + 1,0 \cdot 10 ⁻⁶ ·L	
	0,01 mm	6,3 μm + 0,5 \cdot 10 ⁻⁶ ·L		



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Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement Capability \pm ¹⁾	Remarks	
Depth Micrometers	2 - 300 mm	0,001 mm	$2,7 \mu\text{m} + 1,0 \cdot 10^{-6} \cdot L$	Digital indication	
		0,01 mm	$11,8 \mu\text{m} + 0,5 \cdot 10^{-6} \cdot L$		
		Also available ON-SITE with bigger uncertainty.			
		Scale interval			
	0 - 25 mm	0,001 mm	$0,6 \mu\text{m} + 4,0 \cdot 10^{-6} \cdot L$		Analog indication
		0,010 mm	$5,8 \mu\text{m}$		
	0 - 25 mm	0,001 mm	$1,2 \mu\text{m} + 0,5 \cdot 10^{-6} \cdot L$		Digital indication
		0,010 mm	$11,6 \mu\text{m}$		
	>25 - 100 mm	0,001 mm	$0,6 \mu\text{m} + 1,2 \cdot 10^{-6} \cdot L$		Analog indication
		0,010 mm	$5,8 \mu\text{m}$		
>25 - 100 mm	0,001 mm	$1,2 \mu\text{m} + 1,0 \cdot 10^{-6} \cdot L$	Digital indication		
	0,010 mm	$11,6 \mu\text{m}$			
>100 - 150 mm	0,001 mm	$0,5 \mu\text{m} + 3,0 \cdot 10^{-6} \cdot L$	Analog indication		
	0,010 mm	$5,8 \mu\text{m} + 0,5 \cdot 10^{-6} \cdot L$			
>100 - 150 mm	0,001 mm	$1,1 \mu\text{m} + 2,0 \cdot 10^{-6} \cdot L$	Digital indication		
	0,010 mm	$11,6 \mu\text{m}$			
Height measuring instrument		Also available ON-SITE.			
	Up to 1000 m	Scale interval			
		0,1 μm	$0,3 \mu\text{m} + 3,5 \cdot 10^{-6} \cdot L$	Calibration with angular Laser interferometer	
Master piece for probe constant	610 mm	0,1 μm	$1,2 \mu\text{m} + 2,6 \cdot 10^{-6} \cdot L$	Calibration with step gauge	
			$0,5 \mu\text{m} + 2,0 \cdot 10^{-6} \cdot L$	Calibration with horizontal length measuring machine	



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Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement Capability \pm ¹⁾	Remarks
Straightness standards	Up to 1500 mm	Also available ON-SITE.	$0,6 \mu\text{m} + 0,2 \cdot 10^{-6} \cdot L$	with angular Laser interferometer
Plug gauges	20 - 400 mm	Also available ON-SITE with bigger uncertainty.	$0,35 \mu\text{m} + 1,5 \cdot 10^{-6} \cdot L$	
Pin gauges and plugs	0.05 – 20 mm	Also available ON-SITE with bigger uncertainty.	$0,3 \mu\text{m}$	
Gap gauges	1 - 150 mm	Also available ON-SITE with bigger uncertainty.	$0,30 \mu\text{m} + 1,5 \cdot 10^{-6} \cdot L$	
Ring gauges	0.4 - 400 mm	Also available ON-SITE with bigger uncertainty.	$0,30 \mu\text{m} + 1,5 \cdot 10^{-6} \cdot L$	
Thread ring gauges	1.2 - 350 mm	Also available ON-SITE with bigger uncertainty.	$2,2 \mu\text{m} + 1,0 \cdot 10^{-6} \cdot L$	
	Pitch 0.25 - 6 mm			Simple pitch diameter
Thread plug gauges	0.3 - 300 mm	Also available ON-SITE with bigger uncertainty.	$2,1 \mu\text{m} + 0,5 \cdot 10^{-6} \cdot L$	
	Pitch 0.08 - 6 mm			Simple pitch diameter
Gauge blocks	0.5 mm to 100 mm	Material		
Central length		Steel	$0,07 \mu\text{m} + 0,4 \cdot 10^{-6} \cdot L$	
		Ceramic	$0,08 \mu\text{m} + 0,4 \cdot 10^{-6} \cdot L$	



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Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement Capability \pm ¹⁾	Remarks
Variation in length V with f_o and f_u	100 mm a 1100 mm	Tungsten carbide	0,1 μm + $0,4 \cdot 10^{-6} \cdot L$	Measure with horizontal machine one coordinate
Central length			0,05 μm	
Variation in length V with f_o and f_u			0,25 μm + $1 \cdot 10^{-6} \cdot L$	
Internal Micrometers 2 points	25 mm a 1100 mm		0,25 μm + $1 \cdot 10^{-6} \cdot L$	Measure with horizontal machine one coordinate
Form measurement				
Roundness	External 0.3 mm a 300		0.10 μm	
	Internal 0.5 mm a 360		0.10 μm	
Machine Tools & EDM Machines				Evaluation according to VDI/DGQ 3441, ISO 230-2/4
Positioning error of linear axes	Up to 30 m	<i>Calibration on-site</i>	0,2 μm + $3 \cdot 10^{-6} \cdot L$	with Laser interferometer
Horizontal length measuring machine	Up to 1 m	<i>Calibration on-site</i>	0,2 μm + $1,3 \cdot 10^{-6} \cdot L$	with Laser interferometer + Slip Gauge Block
Coordinate measuring machine	Up to 1m	<i>Calibration on-site</i>	Uncertainty of the used standard (step gauge) 0,2 μm + $0,5 \cdot 10^{-6} \cdot L$	Calibration in accordance to ISO 10360-2 or VDI 2617



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Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement Capability \pm ¹⁾	Remarks
Laser distance measuring instrument	Up to 1,7 m		≥ 1 digit	Comparison with Laser interferometer
Perpendicularity of linear axes	Reference length 600 mm	<i>Calibration on-site</i>	Straightness: 1,7 μm / 600mm	Granite square
Positional deviation of rotary axes	Every 30°		Squareness: 1,2 μm / 400 mm 0,4"	With optical polygon and autocollimator
Flatness of surface plate	Lmin, Bmin : 0.2 m Basis ≥ 50 mm	<i>Calibration on-site</i>	0.5 μm + 0,5 $\cdot 10^{-6}\cdot L$ L: Length of surface plate	With electronic level meters, according to DIN 876 and ISO 8512
Granite square	Up to 1 m		Straightness: 0,25 μm + 0,6 $\cdot 10^{-6}\cdot L$ Squareness: 0.6"	With optical square and autocollimator
Direct voltage				
Voltmeters	0 ... <330 mV 0,33 V ... <3,3 V 3,3 V ... <33 V 33 V ... <330 V 330 V ... 1000 V		29 $\cdot 10^{-6}$ + 1.2 μV 13 $\cdot 10^{-6}$ + 2 μV 14 $\cdot 10^{-6}$ + 24 μV 21 $\cdot 10^{-6}$ + 0.1 mV 21 $\cdot 10^{-6}$ + 1.8 mV	<i>On-site calibration possible</i>
Calibration of voltage probes	32 V ... <320 V 320 V ... 1050 V		405 $\cdot 10^{-6}$ + 22 mV 410 $\cdot 10^{-6}$ + 66 mV	<i>On-site calibration possible</i>
Calibrators	0 mV ... 200 mV >0,2 V ... 2 V >2 V ... 20 V >20 V ... 200 V		5.1 $\cdot 10^{-6}$ + 0,6 μV 3.5 $\cdot 10^{-6}$ + 6 μV 3.5 $\cdot 10^{-6}$ + 58 μV 5.5 $\cdot 10^{-6}$ + 0.6 μV	<i>On-site calibration possible</i>



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Direct current Current meters	>200 V ... 1000 V		$5.5 \cdot 10^{-6} + 5.8 \mu\text{V}$	
	0 ... <330 μA		$208 \cdot 10^{-6} + 62.2 \text{ nA}$	<i>On-site calibration possible</i>
	0.33 ... <3.3 mA		$163 \cdot 10^{-6} + 81.6 \text{ nA}$	
	3.3 ... <33 mA		$119 \cdot 10^{-6} + 0.6 \mu\text{A}$	
	33 ... <330 mA		$129 \cdot 10^{-6} + 6.5 \mu\text{A}$	
	0,33 ... <1.1 A		$258 \cdot 10^{-6} + 46.2 \mu\text{A}$	
	1.1 ... <3 A		$440 \cdot 10^{-6} + 46.2 \mu\text{A}$	
	3 ... <11 A		$580 \cdot 10^{-6} + 577.4 \mu\text{A}$	
11 ... 20.5 A		$1,16 \cdot 10^{-3} + 866 \mu\text{A}$		
Calibrators	0 μA ... 200 μA		$12 \cdot 10^{-6} + 0.7 \text{ nA}$	<i>On-site calibration possible</i>
	>200 μA ... 2 mA		$12 \cdot 10^{-6} + 5.8 \text{ nA}$	
	>2 mA ... 20 mA		$14 \cdot 10^{-6} + 58 \text{ nA}$	
	>20 mA ... 200 mA		$48 \cdot 10^{-6} + 0.6 \mu\text{A}$	
	>20 mA ... 2 A		$185 \cdot 10^{-6} + 5.8 \mu\text{A}$	
	>2 A ... 20 A		$400 \cdot 10^{-6} + 57.7 \mu\text{A}$	
Clamp meters and current transducers	1 mA ... <33 mA		$28 \cdot 10^{-4} + 0.2 \mu\text{A}$	<i>On-site calibration possible</i>
	33 mA ... <330 mA		$28 \cdot 10^{-4} + 1.5 \mu\text{A}$	
	0.33 A ... <1.1 A		$28 \cdot 10^{-4} + 20 \mu\text{A}$	
	1.1 A ... <3 A		$29 \cdot 10^{-4} + 20 \mu\text{A}$	
	3 A ... <11 A		$29 \cdot 10^{-4} + 0.3 \text{ mA}$	
	11 A ... <20.5 A		$30 \cdot 10^{-4} + 0.5 \text{ mA}$	
	20.5 A ... <110 A		$37 \cdot 10^{-4} + 2.9 \text{ mA}$	
	110 A ... <205 A		$38 \cdot 10^{-4} + 4.4 \text{ mA}$	
	205 A ... <550 A		$37 \cdot 10^{-4} + 14.5 \text{ mA}$	
550 A ... 1025 A		$38 \cdot 10^{-4} + 21.7 \text{ mA}$		



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Alternate voltage Voltmeters	1 mV ... <32 mV	10 Hz ... 45 Hz	$924 \cdot 10^{-6} + 7 \mu\text{V}$	<i>On-site calibration possible</i>
		>45 Hz ... 10 kHz	$175 \cdot 10^{-6} + 7 \mu\text{V}$	
		>10 kHz ... 20 kHz	$232 \cdot 10^{-6} + 7 \mu\text{V}$	
		>20 kHz ... 50 kHz	$1.2 \cdot 10^{-3} + 7 \mu\text{V}$	
		>50 kHz...100 kHz	$4.1 \cdot 10^{-3} + 14 \mu\text{V}$	
		>100kHz...500kHz	$9.2 \cdot 10^{-3} + 58 \mu\text{V}$	
	33 mV ... <330 mV	10 Hz ... 45 Hz	$347 \cdot 10^{-6} + 10.9 \mu\text{V}$	
		>45 Hz ... 10 kHz	$169 \cdot 10^{-6} + 9.3 \mu\text{V}$	
		>10 kHz ... 20 kHz	$186 \cdot 10^{-6} + 9.3 \mu\text{V}$	
		>20 kHz ... 50 kHz	$408 \cdot 10^{-6} + 9.3 \mu\text{V}$	
		>50 kHz...100 kHz	$926 \cdot 10^{-6} + 37 \mu\text{V}$	
		>100kHz...500kHz	$2.31 \cdot 10^{-3} + 81 \mu\text{V}$	
	0.33 mV ... <3.3 V	10 Hz ... 45 Hz	$347 \cdot 10^{-6} + 58 \mu\text{V}$	
		>45 Hz ... 10 kHz	$175 \cdot 10^{-6} + 70 \mu\text{V}$	
		>10 kHz ... 20 kHz	$221 \cdot 10^{-6} + 70 \mu\text{V}$	
		>20 kHz ... 50 kHz	$347 \cdot 10^{-6} + 58 \mu\text{V}$	
		>50 kHz...100 kHz	$810 \cdot 10^{-6} + 145 \mu\text{V}$	
		>100kHz...500kHz	$2.8 \cdot 10^{-3} + 693 \mu\text{V}$	
3.3 V ... <33 V	10 Hz ... 45 Hz	$347 \cdot 10^{-6} + 753 \mu\text{V}$		
	>45 Hz ... 10 kHz	$175 \cdot 10^{-6} + 695 \mu\text{V}$		
	>10 kHz ... 20 kHz	$278 \cdot 10^{-6} + 695 \mu\text{V}$		
	>20 kHz ... 50 kHz	$405 \cdot 10^{-6} + 695 \mu\text{V}$		
	>50 kHz...100 kHz	$1041 \cdot 10^{-6} + 1.8 \text{ mV}$		
	45 Hz ... 1 kHz	$221 \cdot 10^{-6} + 2.4 \text{ mV}$		
33 V ... <330 V	>1 kHz ... 10 kHz	$232 \cdot 10^{-6} + 7 \text{ mV}$		
	330 V ... 1020 V			



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Calibration of voltage probes	32 V ... <320 V 320 V ... 1050 V	>10 kHz ... 20 kHz	$290 \cdot 10^{-6} + 7 \text{ mV}$	<i>On-site calibration possible</i>
		>20 kHz ... 50 kHz	$347 \cdot 10^{-6} + 7 \text{ mV}$	
Calibrators	0 mV ... 200 mV	Max 60 Hz	$695 \cdot 10^{-6} + 44 \text{ mV}$	
		Max 60 Hz	$700 \cdot 10^{-6} + 258 \text{ mV}$	
	>200 mV .. 2V	1 Hz .. 10 Hz	$167 \cdot 10^{-6} + 14 \text{ }\mu\text{V}$	<i>On-site calibration possible</i>
		>10 Hz .. 40 Hz	$143 \cdot 10^{-6} + 4 \text{ }\mu\text{V}$	
		>40 Hz .. 100 Hz	$118 \cdot 10^{-6} + 4 \text{ }\mu\text{V}$	
		>100 Hz .. 2 kHz	$113 \cdot 10^{-6} + 2.1 \text{ }\mu\text{V}$	
		>2 kHz .. 10 kHz	$138 \cdot 10^{-6} + 4 \text{ }\mu\text{V}$	
		>10 kHz .. 30kHz	$341 \cdot 10^{-6} + 8 \text{ }\mu\text{V}$	
		>30 kHz .. 100 kHz	$766 \cdot 10^{-6} + 20 \text{ }\mu\text{V}$	
	>2V .. 20 V	1 Hz .. 10 Hz	$151 \cdot 10^{-6} + 120 \text{ }\mu\text{V}$	
		>10 Hz .. 40 Hz	$117 \cdot 10^{-6} + 21 \text{ }\mu\text{V}$	
		>40 Hz .. 100 Hz	$92 \cdot 10^{-6} + 21 \text{ }\mu\text{V}$	
		>100 Hz .. 2 kHz	$77 \cdot 10^{-6} + 21 \text{ }\mu\text{V}$	
		>2 kHz .. 10 kHz	$112 \cdot 10^{-6} + 21 \text{ }\mu\text{V}$	
>10 kHz .. 30kHz		$221 \cdot 10^{-6} + 40 \text{ }\mu\text{V}$		
>30 kHz .. 100 kHz		$571 \cdot 10^{-6} + 200 \text{ }\mu\text{V}$		
>20V .. 200 V	1 Hz .. 10 Hz	$9 \cdot 10^{-6} + 58 \text{ }\mu\text{V}$		
	>10 Hz .. 40 Hz	$116 \cdot 10^{-6} + 208 \text{ }\mu\text{V}$		
	>40 Hz .. 100 Hz	$91 \cdot 10^{-6} + 208 \text{ }\mu\text{V}$		
	>100 Hz .. 2 kHz	$76 \cdot 10^{-6} + 208 \text{ }\mu\text{V}$		
	>2 kHz .. 10 kHz	$111 \cdot 10^{-6} + 208 \text{ }\mu\text{V}$		
	>10 kHz .. 30kHz	$220 \cdot 10^{-6} + 404 \text{ }\mu\text{V}$		
	>30 kHz .. 100 kHz	$570 \cdot 10^{-6} + 2001 \text{ }\mu\text{V}$		
		1 Hz .. 10 Hz	$6.8 \cdot 10^{-6} + 1 \text{ mV}$	
		>10 Hz .. 40 Hz	$115 \cdot 10^{-6} + 2 \text{ mV}$	
		>40 Hz .. 100 Hz	$90 \cdot 10^{-6} + 2 \text{ mV}$	
		>100 Hz .. 2 kHz	$75 \cdot 10^{-6} + 2 \text{ mV}$	
		>2 kHz .. 10 kHz	$110 \cdot 10^{-6} + 2 \text{ mV}$	
		>10 kHz .. 30kHz	$220 \cdot 10^{-6} + 4 \text{ mV}$	
		>30 kHz .. 100 kHz	$570 \cdot 10^{-6} + 20 \text{ mV}$	



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Alternate current Current meters	>200 V .. 1000 V	1 Hz .. 10 Hz	$190 \cdot 10^{-6} + 80$ mV	<i>On-site calibration possible</i>
		>10 Hz .. 40 Hz	$145 \cdot 10^{-6} + 26$ mV	
		>40 Hz .. 10 kHz	$140 \cdot 10^{-6} + 26$ mV	
		>10 kHz .. 30kHz	$265 \cdot 10^{-6} + 50$ mV	
		>30 kHz .. 100 kHz	$700 \cdot 10^{-6} + 250$ mV	
	29 μ A ... <330 μ A	10 Hz ... 20 Hz	$2,4 \cdot 10^{-3} + 0,3$ μ A	
		>20 Hz ... 45 Hz	$1,8 \cdot 10^{-3} + 0,3$ μ A	
		>45 Hz ... 1 kHz	$1,5 \cdot 10^{-3} + 0,3$ μ A	
		>1 kHz ... 5 kHz	$3,5 \cdot 10^{-3} + 0,3$ μ A	
		>5 kHz ... 10 kHz	$9,3 \cdot 10^{-3} + 0,4$ μ A	
		>10 kHz ... 30 kHz	$18,5 \cdot 10^{-3} + 0,6$ μ A	
	0.33 mA ... <3.3mA	10 Hz ... 20 Hz	$2,4 \cdot 10^{-3} + 0,3$ μ A	
		>20 Hz ... 45 Hz	$1,5 \cdot 10^{-3} + 0,3$ μ A	
		>45 Hz ... 1 kHz	$1,2 \cdot 10^{-3} + 0,3$ μ A	
		>1 kHz ... 5 kHz	$2,4 \cdot 10^{-3} + 0,4$ μ A	
		>5 kHz ... 10 kHz	$5,8 \cdot 10^{-3} + 0,5$ μ A	
>10 kHz ... 30 kHz		$11,6 \cdot 10^{-3} + 0,8$ μ A		
3.3 mA ... <33 mA	10 Hz ... 20 Hz	$2,1 \cdot 10^{-3} + 3,3$ μ A		
	>20 Hz ... 45 Hz	$1,1 \cdot 10^{-3} + 3,3$ μ A		
	>45 Hz ... 1 kHz	$462 \cdot 10^{-6} + 3,3$ μ A		
	>1 kHz ... 5 kHz	$924 \cdot 10^{-6} + 3,3$ μ A		
	>5 kHz ... 10 kHz	$2,4 \cdot 10^{-3} + 4,2$ μ A		
	>10 kHz ... 30 kHz	$4,6 \cdot 10^{-3} + 5,2$ μ A		
33 mA ... <330 mA	10 Hz ... 20 Hz	$2,1 \cdot 10^{-3} + 23,9$ μ A		
	>20 Hz ... 45 Hz	$1,1 \cdot 10^{-3} + 23,9$ μ A		
	>45 Hz ... 1 kHz	$462 \cdot 10^{-6} + 23,9$ μ A		
	>1 kHz ... 5 kHz	$1,2 \cdot 10^{-3} + 58,1$ μ A		
	>5 kHz ... 10 kHz	$2,4 \cdot 10^{-3} + 116$ μ A		



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Calibrators	0.33 A ... <1.1 A	>10 kHz ... 30 kHz	$4,7 \cdot 10^{-3} + 231 \mu\text{A}$	<i>On-site calibration possible</i>	
		10 Hz ... 45 Hz	$2,1 \cdot 10^{-3} + 116 \mu\text{A}$		
		>45 Hz ... 1 kHz	$577 \cdot 10^{-6} + 116 \mu\text{A}$		
		>1 kHz ... 5 kHz	$7,0 \cdot 10^{-3} + 12 \text{ mA}$		
	1.1 A ... <3 A	>5 kHz ... 10 kHz	$28,9 \cdot 10^{-3} + 58 \text{ mA}$		
		10 Hz ... 45 Hz	$2,1 \cdot 10^{-3} + 147 \mu\text{A}$		
		>45 Hz ... 1 kHz	$693 \cdot 10^{-6} + 147 \mu\text{A}$		
		>1 kHz ... 5 kHz	$7,0 \cdot 10^{-3} + 1.2 \text{ mA}$		
	0 .. 200 μA	>5 kHz ... 10 kHz	$28,9 \cdot 10^{-3} + 5.8 \text{ mA}$		
		1 Hz .. 10 Hz	$0.3 \cdot 10^{-3} + 0.6 \mu\text{A}$		
		> 10 Hz .. 10 kHz	$0.3 \cdot 10^{-3} + 0.6 \mu\text{A}$		
		> 10 kHz .. 30 kHz	$0.7 \cdot 10^{-3} + 0.6 \mu\text{A}$		
	>200 μA .. 2 mA	> 30 kHz ..100 kHz	$4 \cdot 10^{-3} + 0.6 \mu\text{A}$		
		1 Hz .. 10 Hz	$0.3 \cdot 10^{-3} + 0.6 \mu\text{A}$		
> 10 Hz .. 10 kHz		$0.3 \cdot 10^{-3} + 0.6 \mu\text{A}$			
> 10 kHz .. 30 kHz		$0.7 \cdot 10^{-3} + 0.6 \mu\text{A}$			
>2mA .. 20 mA	> 30 kHz ..100 kHz	$4 \cdot 10^{-3} + 0.6 \mu\text{A}$			
	1 Hz .. 10 Hz	$0.3 \cdot 10^{-3} + 6.1 \mu\text{A}$			
	> 10 Hz .. 10 kHz	$0.3 \cdot 10^{-3} + 6.1 \mu\text{A}$			
	> 10 kHz .. 30 kHz	$0.7 \cdot 10^{-3} + 6.1 \mu\text{A}$			
>20 mA .. 200 mA	> 30 kHz ..100 kHz	$4 \cdot 10^{-3} + 6.1 \mu\text{A}$			
	1 Hz .. 10 Hz	$0.4 \cdot 10^{-3} + 20 \mu\text{A}$			
	> 10 Hz .. 10 kHz	$0.3 \cdot 10^{-3} + 20 \mu\text{A}$			
	> 10 kHz .. 30 kHz	$0.7 \cdot 10^{-3} + 20 \mu\text{A}$			
>200 mA .. 2 A	10 Hz .. 2 kHz	$0.7 \cdot 10^{-3} + 0.2 \text{ mA}$			
	> 2 kHz .. 10 kHz	$0.8 \cdot 10^{-3} + 0.2 \text{ mA}$			
	> 10 kHz .. 30 kHz	$3 \cdot 10^{-3} + 0.2 \text{ mA}$			
>2 A .. 20 A	10 Hz .. 2 kHz	$0.9 \cdot 10^{-3} + 2 \text{ mA}$			
	> 2 kHz .. 10 kHz	$2.5 \cdot 10^{-3} + 2 \text{ mA}$			
Clamp meters and current transducers	1 mA ... <3.3 mA	45 Hz ... 1 kHz	$30 \cdot 10^{-4} + 0.1 \mu\text{A}$	<i>On-site calibration possible</i>	
	3.3 mA ... <33 mA	45 Hz ... 1 kHz	$29 \cdot 10^{-4} + 1.2 \mu\text{A}$		
	33 mA ... <330 mA	45 Hz ... 1 kHz	$29 \cdot 10^{-4} + 11.6 \mu\text{A}$		
	0.33 A ... <1.1 A	45 Hz ... 1 kHz	$29 \cdot 10^{-4} + 60 \text{ uA}$		
	1.1 A ... <3 A	45 Hz ... 1 kHz	$29 \cdot 10^{-4} + 60 \text{ uA}$		



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Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement Capability \pm ¹⁾	Remarks
Resistance Ohm-meters	3 A ... <11 A	45 Hz ... 1 kHz	$30 \cdot 10^{-4} + 1.2 \text{ mA}$	
	11 A ... <20.5 A	45 Hz ... 1 kHz	$32 \cdot 10^{-4} + 2.9 \text{ mA}$	
	20.5 A ... <110 A	60 Hz ... 400 Hz	$37 \cdot 10^{-4} + 0.6 \text{ mA}$	
	110 A ... <205 A	60 Hz ... 400 Hz	$39 \cdot 10^{-4} + 28.9 \text{ mA}$	
	205 A ... <550 A	60 Hz ... 400 Hz	$38 \cdot 10^{-4} + 57.8 \text{ mA}$	
	550 A ... 1025 A	60 Hz ... 400 Hz	$39 \cdot 10^{-4} + 144.4 \text{ mA}$	
	0 Ω ... <11 Ω		$52 \cdot 10^{-6} + 0.6 \text{ m}\Omega$	
	11 Ω ... <33 Ω		$42 \cdot 10^{-6} + 0.6 \text{ m}\Omega$	
	33 Ω ... <110 Ω		$40 \cdot 10^{-6} + 0.6 \text{ m}\Omega$	
	110 Ω ... <330 Ω		$33 \cdot 10^{-6} + 5.8 \text{ m}\Omega$	
	330 Ω ... <1.1 k Ω		$33 \cdot 10^{-6} + 5.8 \text{ m}\Omega$	
	1.1 k Ω ... <3.3 k Ω		$33 \cdot 10^{-6} + 57.7 \text{ m}\Omega$	
	3.3 k Ω ... <11 k Ω		$33 \cdot 10^{-6} + 57.7 \text{ m}\Omega$	
	11 k Ω ... <33 k Ω		$33 \cdot 10^{-6} + 0.6 \Omega$	
	33 k Ω ... <110 k Ω		$33 \cdot 10^{-6} + 0.6 \Omega$	
	110 k Ω ... <330 k Ω		$37 \cdot 10^{-6} + 5.8 \Omega$	
	330 k Ω ... <1.1 M Ω		$37 \cdot 10^{-6} + 5.8 \Omega$	
1.1 M Ω ... <3.3 M Ω		$70 \cdot 10^{-6} + 58 \Omega$		
3.3 M Ω ... <11 M Ω		$150 \cdot 10^{-6} + 58 \Omega$		
11 M Ω ... <33 M Ω		$294 \cdot 10^{-6} + 0.6 \text{ k}\Omega$		
33 M Ω ... <110 M Ω		$580 \cdot 10^{-6} + 0.6 \text{ k}\Omega$		
110 M Ω ... <330 M Ω		$3.51 \cdot 10^{-3} + 5.8 \text{ k}\Omega$		
330 M Ω ... 1.1 G Ω		$17.33 \cdot 10^{-3} + 5.8 \text{ k}\Omega$		
Resistance	0 Ω ... 2 Ω		$17 \cdot 10^{-6} + 4 \mu\Omega$	<i>On-site calibration possible</i>
	>2 Ω ... 20 Ω		$10 \cdot 10^{-6} + 14 \mu\Omega$	
	>20 Ω ... 200 Ω		$8 \cdot 10^{-6} + 50 \mu\Omega$	
	>0.2 k Ω ... 2 k Ω		$8 \cdot 10^{-6} + 0.5 \text{ m}\Omega$	
	>2 k Ω ... 20 k Ω		$8 \cdot 10^{-6} + 5 \text{ m}\Omega$	



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Measured Quantity / Instrument or Gauge	Measurement Range	Measurement Conditions	Best Measurement Capability \pm ¹⁾	Remarks
Calibration of oscilloscopes	>20 k Ω ... 200 k Ω		$8 \cdot 10^{-6} + 50 \text{ m}\Omega$	
	>0.2 M Ω ... 2 M Ω		$9 \cdot 10^{-6} + 1 \Omega$	
	>2 M Ω ... 20 M Ω		$20 \cdot 10^{-6} + 100 \Omega$	
	>20 M Ω ... 200 M Ω		$120 \cdot 10^{-6} + 10 \text{ k}\Omega$	
	>0.2 G Ω ... 2 G Ω		$1510 \cdot 10^{-6} + 1 \text{ M}\Omega$	
Square wave signal amplitude	1 mV ... 6.6 V		$59 \cdot 10^{-4} + 48 \mu\text{V}$	50 Ohm
	1 mV ... 130 V		$13 \cdot 10^{-4} + 6 \mu\text{V}$	1 MOhm
Time marker	500 ps ... <2 ns		$12 \cdot 10^{-6} + 13 \mu\text{s}$	
	2 ns ... <5 ns		$12 \cdot 10^{-6} + 130 \mu\text{s}$	
	5 ns ... <20 ns		$12 \cdot 10^{-6} + 1.3 \text{ ns}$	
	20 ns ... <100 ns		$12 \cdot 10^{-6} + 1.3 \text{ ns}$	
	100 ns ... <50 ms		$12 \cdot 10^{-6} + 13 \text{ ns}$	
	50 ms ... <5 s		$29 \cdot 10^{-6} + 130 \text{ ns}$	
Risetime	750 ps ... 1000 ns		29,8 ps - 28,3 ns	
Torque				
Torque wrench and screwdriver	0.001 Nm ... 1 Nm	With torque transducers	1 %	<i>On-site calibration possible</i>
	1 Nm ... 3000 Nm		1 %	
Static torque transducers and torque wrench calibrators	0.05 cN·m...1 cN·m	Using calibration beams	0.22 %	
	0.01 N·m .. 0.1 N·m		0.12 %	
	0.1 N·m .. 15 N·m		0.1 %	
	1 .. 3000 N·m	Using transfer torque wrenches	0.14 %	<i>On-site calibration possible</i>

(1) The given extended measurement uncertainty is the standard uncertainty of the measurement multiplied by an extension factor $k = 2$, which corresponds to a confidence level of about 95% for a normal distribution.

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