

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-K-12161-01-00 according to DIN EN ISO/IEC 17025:2018

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Holder of certificate:

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Calibration in the fields:

Dimensional quantities

Length

- Length measuring instruments
- Diameter
- Thread

Electrical quantities

DC and low frequency quantities

- DC voltage
- AC voltage
- DC current ^{a)}
- AC current ^{a)}
- DC resistance

Time and frequency

- Frequency
- Time interval

High frequency quantities

- Oscilloscope quantities
- Rise time
- Band width

^{a)} also on-site calibration

Abbreviations used: see last page

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Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾	Remarks
Length				
Calipers for external, internal and depth dimensions	0 mm to 150 mm	DKD-R 4-3 Blatt 9.1:2018	$30 \mu\text{m} + 30 \cdot 10^{-6} \cdot l$	$l =$ measured length
Depth calipers	0 mm to 150 mm	DKD-R 4-3 Blatt 9.2:2018	$30 \mu\text{m} + 30 \cdot 10^{-6} \cdot l$	
Micrometers	0 mm to 75 mm	DKD-R 4-3 Blatt 10.1:2018	$3 \mu\text{m} + 10 \cdot 10^{-6} \cdot l$	
Dial gauges	to 12 mm	DKD-R 4-3 Blatt 11.1:2018	$3 \mu\text{m} + 10 \cdot 10^{-6} \cdot l$	
Lever gauges	to 1,6 mm	DKD-R 4-3 Blatt 11.3:2018	2 μm	
Setting ring gauges Diameter	2,5 mm to 200 mm	DKD-R 4-3 Blatt 4.1:2018 Option 5.3.3	$2 \mu\text{m} + 10 \cdot 10^{-6} \cdot d$	$d =$ measured diameter
Setting plug gauges Diameter	5 mm to 30 mm	DKD-R 4-3 Blatt 4.1:2018 Option 5.3.3	$2 \mu\text{m} + 10 \cdot 10^{-6} \cdot d$	
Measuring pins Diameter	0,1 mm to 20 mm	DKD-R 4-3 Blatt 4.2:2018 Option 5.3.3	2 μm	
Thread Metrical ISO-thread				
External thread Simple pitch diameter	1,6 mm to 27 mm	DKD-R 4-3 Blatt 4.8:2018 Option 1 Three wire procedure (vertical to thread axis)	5 μm	
Internal thread Simple pitch diameter	2,5 mm to 35 mm	DKD-R 4-3 Blatt 4.9:2018 Option 1 Two ball procedure (vertical to thread axis)	4 μm	

¹⁾ The expanded uncertainties according to EA-4/02 M:2013 are part of CMC and are the best measurement uncertainties within accreditation. They have a coverage probability of approximately 95 % and have a coverage factor of $k = 2$ unless stated otherwise. Uncertainties without unit are relative uncertainties referring to the measurement value unless stated otherwise.

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Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement ¹⁾	Remarks
DC and low frequency quantities DC voltage Measuring instruments	0 mV to < 330 mV 0,33 V to < 33 V 33 V to 1000 V		$17 \cdot 10^{-6} \cdot U + 3 \mu\text{V}$ $18 \cdot 10^{-6} \cdot U$ $23 \cdot 10^{-6} \cdot U$	U = set value with Fluke 5520A
	0 mV to < 100 mV 0,1 V to < 1 V 1 V to 10 V > 10 V to < 100 V 100 V to 200 V > 200 V to 400 V > 400 V to 500 V > 500 V to 600 V > 600 V to 700 V > 700 V to 800 V > 800 V to 900 V > 900 V to 1050 V		$3 \cdot 10^{-6} \cdot U + 1,9 \mu\text{V}$ $68 \cdot 10^{-6} \cdot U$ $12 \cdot 10^{-6} \cdot U$ $16 \cdot 10^{-6} \cdot U$ $8 \cdot 10^{-6} \cdot U$ $9 \cdot 10^{-6} \cdot U$ $10 \cdot 10^{-6} \cdot U$ $11 \cdot 10^{-6} \cdot U$ $12 \cdot 10^{-6} \cdot U$ $14 \cdot 10^{-6} \cdot U$ $16 \cdot 10^{-6} \cdot U$ $18 \cdot 10^{-6} \cdot U$	U = measuring value with Agilent 3458A
AC voltage Measuring instruments	1 mV to < 33 mV	10 Hz to 45 Hz > 45 Hz to 10 kHz > 10 kHz to 20 kHz > 20 kHz to 50 kHz > 50 kHz to 100 kHz > 100 kHz to 500 kHz	$9 \cdot 10^{-3} \cdot U$ $6,8 \cdot 10^{-3} \cdot U$ $7 \cdot 10^{-3} \cdot U$ $7,7 \cdot 10^{-3} \cdot U$ $16 \cdot 10^{-3} \cdot U$ $56 \cdot 10^{-3} \cdot U$	U = set value with Fluke 5520A
	33 mV to < 330 mV	10 Hz to 45 Hz > 45 Hz to 10 kHz > 10 kHz to 50 kHz > 50 kHz to 100 kHz > 100 kHz to 500 kHz	$2 \cdot 10^{-3} \cdot U$ $0,81 \cdot 10^{-3} \cdot U$ $1 \cdot 10^{-3} \cdot U$ $1,9 \cdot 10^{-3} \cdot U$ $4,7 \cdot 10^{-3} \cdot U$	
	0,33 V to < 3,3 V	10 Hz to 45 Hz > 45 Hz to 10 kHz > 10 kHz to 20 kHz > 20 kHz to 50 kHz > 50 kHz to 100 kHz > 100 kHz to 500 kHz	$1,8 \cdot 10^{-3} \cdot U$ $0,78 \cdot 10^{-3} \cdot U$ $0,95 \cdot 10^{-3} \cdot U$ $0,98 \cdot 10^{-3} \cdot U$ $1,4 \cdot 10^{-3} \cdot U$ $4,8 \cdot 10^{-3} \cdot U$	
	3,3 V to < 33 V	10 Hz to 45 Hz > 45 Hz to 10 kHz > 10 kHz to 20 kHz > 20 kHz to 50 kHz > 50 kHz to 100 kHz	$1,4 \cdot 10^{-3} \cdot U$ $0,78 \cdot 10^{-3} \cdot U$ $1 \cdot 10^{-3} \cdot U$ $1,1 \cdot 10^{-3} \cdot U$ $1,6 \cdot 10^{-3} \cdot U$	
	33 V to < 330 V	> 45 Hz to 1 kHz > 1 kHz to 10 kHz > 10 kHz to 20 kHz > 20 kHz to 50 kHz > 50 kHz to 100 kHz	$0,3 \cdot 10^{-3} \cdot U$ $0,37 \cdot 10^{-3} \cdot U$ $0,42 \cdot 10^{-3} \cdot U$ $0,49 \cdot 10^{-3} \cdot U$ $3,4 \cdot 10^{-3} \cdot U$	

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AC voltage Measuring instruments	330 V to 1020 V	> 45 Hz to 1 kHz > 1 kHz to 5 kHz > 5 kHz to 10 kHz	$1,2 \cdot 10^{-3} \cdot U$ $0,38 \cdot 10^{-3} \cdot U$ $0,41 \cdot 10^{-3} \cdot U$	U = set value with Fluke 5520A
AC voltage Sources	1 mV to 12 mV > 12 mV to 120 mV	100 Hz to 20 kHz	$10 \cdot 10^{-3} \cdot U + 18 \mu\text{V}$ $2,1 \cdot 10^{-3} \cdot U$	U = measuring value with Agilent 3458A
	> 0,12 V to 1,2 V	20 Hz to < 40 Hz 40 Hz to < 100 Hz 100 Hz to 20 kHz > 20 kHz to 50 kHz > 50 kHz to 100 kHz > 100 kHz to 250 kHz	$4,7 \cdot 10^{-3} \cdot U$ $2,4 \cdot 10^{-3} \cdot U$ $1,9 \cdot 10^{-3} \cdot U$ $7,8 \cdot 10^{-3} \cdot U$ $18,4 \cdot 10^{-3} \cdot U$ $0,1 \cdot 10^{-0} \cdot U$	
	> 1,2 V to 12 V	20 Hz to < 40 Hz 40 Hz to < 100 Hz 100 Hz to 20 kHz > 20 kHz to 50 kHz > 50 kHz to 100 kHz > 100 kHz to 250 kHz	$4,8 \cdot 10^{-3} \cdot U$ $2,5 \cdot 10^{-3} \cdot U$ $2,2 \cdot 10^{-3} \cdot U$ $7,9 \cdot 10^{-3} \cdot U$ $14 \cdot 10^{-3} \cdot U$ $0,1 \cdot 10^{-0} \cdot U$	
	> 12 V to 120 V	20 Hz to < 40 Hz 40 Hz to < 100 Hz 100 Hz to 20 kHz > 20 kHz to 50 kHz > 50 kHz to 100 kHz > 100 kHz to 250 kHz	$5 \cdot 10^{-3} \cdot U$ $2,4 \cdot 10^{-3} \cdot U$ $2,2 \cdot 10^{-3} \cdot U$ $7,9 \cdot 10^{-3} \cdot U$ $14 \cdot 10^{-3} \cdot U$ $0,1 \cdot 10^{-0} \cdot U$	
	> 120 V to 1000 V	40 Hz to < 100 Hz 100 Hz to 20 kHz	$8,3 \cdot 10^{-3} \cdot U$ $8,2 \cdot 10^{-3} \cdot U$	
	DC current Measuring instruments	0 A to < 330 μA 0,33 mA to < 1,1 A 1,1 A to < 3 A 3 A to < 11 A 11 A to 20,5 A 20 A to 100 A		
DC current Sources	0 A to 1,2 μA > 1,2 μA to 12 μA > 12 μA to 120 μA > 0,12 mA to 12 mA > 12 mA to 120 mA > 120 mA to 1,05 A 1 A to 30 A 30 A to 500 A > 500 A to 2000 A		$0,2 \cdot 10^{-3} \cdot I + 0,1 \text{ nA}$ $0,24 \cdot 10^{-3} \cdot I$ $69 \cdot 10^{-6} \cdot I$ $74 \cdot 10^{-6} \cdot I$ $83 \cdot 10^{-6} \cdot I$ $0,22 \cdot 10^{-3} \cdot I$ $3,1 \cdot 10^{-3} \cdot I$ $4,9 \cdot 10^{-3} \cdot I$	I = measuring value with Agilent 3458A I = measuring value with Agilent 3458A I = measuring value with Agilent 3458A / Shunt

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DC current Current clamps	20 A to 1000 A		$5,5 \cdot 10^{-3} \cdot I$	$I =$ set value with Fluke 5520A / 5500A-Coil
	100 A to 5000 A		$30 \cdot 10^{-3} \cdot I$	$I =$ set value with Fluke 52120A / 52120A-Coil
AC current Measuring instruments	30 μ A to < 330 μ A	10 Hz to < 20 Hz	$5,4 \cdot 10^{-3} \cdot I$	$I =$ set value with Fluke 5520A
		20 Hz to < 45 Hz	$5 \cdot 10^{-3} \cdot I$	
		45 Hz to 1 kHz	$4,6 \cdot 10^{-3} \cdot I$	
		> 1 kHz to 5 kHz	$8,1 \cdot 10^{-3} \cdot I$	
		> 5 kHz to 10 kHz	$15 \cdot 10^{-3} \cdot I$	
	0,33 mA to < 3,3 mA	> 10 kHz to 30 kHz	$29 \cdot 10^{-3} \cdot I$	
		10 Hz to < 20 Hz	$2,5 \cdot 10^{-3} \cdot I$	
		20 Hz to < 45 Hz	$1,8 \cdot 10^{-3} \cdot I$	
		45 Hz to 1 kHz	$1,6 \cdot 10^{-3} \cdot I$	
3,3 mA to < 33 mA	> 1 kHz to 5 kHz	$2,6 \cdot 10^{-3} \cdot I$		
	> 5 kHz to 10 kHz	$5,8 \cdot 10^{-3} \cdot I$		
	> 10 kHz to 30 kHz	$12 \cdot 10^{-3} \cdot I$		
	10 Hz to < 20 Hz	$2,5 \cdot 10^{-3} \cdot I$		
33 mA to < 330 mA	20 Hz to < 45 Hz	$1,7 \cdot 10^{-3} \cdot I$		
	45 Hz to 1 kHz	$1,1 \cdot 10^{-3} \cdot I$		
	> 1 kHz to 5 kHz	$1,5 \cdot 10^{-3} \cdot I$		
	> 5 kHz to 10 kHz	$3,1 \cdot 10^{-3} \cdot I$		
0,33 A to < 1,1 A	> 10 kHz to 30 kHz	$5,2 \cdot 10^{-3} \cdot I$		
	10 Hz to < 45 Hz	$2,1 \cdot 10^{-3} \cdot I$		
	45 Hz to 1 kHz	$0,78 \cdot 10^{-3} \cdot I$		
	> 1 kHz to 5 kHz	$8,6 \cdot 10^{-3} \cdot I$		
1,1 A to < 3 A	> 5 kHz to 10 kHz	$39 \cdot 10^{-3} \cdot I$		
	10 Hz to < 45 Hz	$1,9 \cdot 10^{-3} \cdot I$		
	45 Hz to 1 kHz	$0,69 \cdot 10^{-3} \cdot I$		
3 A to < 11 A	> 1 kHz to 5 kHz	$6,6 \cdot 10^{-3} \cdot I$		
	> 5 kHz to 10 kHz	$29 \cdot 10^{-3} \cdot I$		
	45 Hz to 100 Hz	$1,3 \cdot 10^{-3} \cdot I$		
11 A to 20,5 A	> 100 Hz to 1 kHz	$1,6 \cdot 10^{-3} \cdot I$		
	> 1 kHz to 5 kHz	$31 \cdot 10^{-3} \cdot I$		
	45 Hz to 100 Hz	$1,6 \cdot 10^{-3} \cdot I$		
		> 100 Hz to 1 kHz	$1,9 \cdot 10^{-3} \cdot I$	
		> 1 kHz to 5 kHz	$29 \cdot 10^{-3} \cdot I$	

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AC current Measuring instruments	20 A to 120 A	10 Hz to 300 Hz > 300 Hz to 1 kHz > 1 kHz to 3 kHz > 3 kHz to 6 kHz > 6 kHz to 10 kHz	$0,63 \cdot 10^{-3} \cdot I$ $1,7 \cdot 10^{-3} \cdot I$ $4,5 \cdot 10^{-3} \cdot I$ $11 \cdot 10^{-3} \cdot I$ $36 \cdot 10^{-3} \cdot I$	<i>I</i> = set value with Fluke 52120A
AC current Sources	10 µA to < 120 µA	10 Hz to < 20 Hz 20 Hz to < 45 Hz 45 Hz to 100 Hz > 100 Hz to 1 kHz	$9 \cdot 10^{-3} \cdot I + 10 \text{ nA}$ $6,5 \cdot 10^{-3} \cdot I + 10 \text{ nA}$ $6 \cdot 10^{-3} \cdot I + 10 \text{ nA}$ $7,5 \cdot 10^{-3} \cdot I + 10 \text{ nA}$	<i>I</i> = set value with Agilent 3458A
	0,12 mA to < 1,2 mA	10 Hz to < 20 Hz 20 Hz to < 45 Hz 45 Hz to 100 Hz > 100 Hz to 5 kHz > 5 kHz to 20 kHz > 20 kHz to 50 kHz > 50 kHz to 100 kHz	$9 \cdot 10^{-3} \cdot I$ $7 \cdot 10^{-3} \cdot I$ $6,5 \cdot 10^{-3} \cdot I$ $6,5 \cdot 10^{-3} \cdot I$ $6,5 \cdot 10^{-3} \cdot I$ $12 \cdot 10^{-3} \cdot I$ $30 \cdot 10^{-3} \cdot I$	
	1,2 mA to < 12 mA	10 Hz to < 20 Hz 20 Hz to < 45 Hz 45 Hz to 100 Hz > 100 Hz to 5 kHz > 5 kHz to 20 kHz > 20 kHz to 50 kHz > 50 kHz to 100 kHz	$7,4 \cdot 10^{-3} \cdot I$ $5,2 \cdot 10^{-3} \cdot I$ $4,6 \cdot 10^{-3} \cdot I$ $4,3 \cdot 10^{-3} \cdot I$ $4,6 \cdot 10^{-3} \cdot I$ $11 \cdot 10^{-3} \cdot I$ $30 \cdot 10^{-3} \cdot I$	
	12 mA to < 120 mA	10 Hz to < 20 Hz 20 Hz to < 45 Hz 45 Hz to 100 Hz > 100 Hz to 5 kHz > 5 kHz to 20 kHz > 20 kHz to 50 kHz > 50 kHz to 100 kHz	$7,4 \cdot 10^{-3} \cdot I$ $5,2 \cdot 10^{-3} \cdot I$ $4,5 \cdot 10^{-3} \cdot I$ $4,2 \cdot 10^{-3} \cdot I$ $4,5 \cdot 10^{-3} \cdot I$ $11 \cdot 10^{-3} \cdot I$ $30 \cdot 10^{-3} \cdot I$	
	0,12 A to 1,05 A	10 Hz to < 20 Hz 20 Hz to < 45 Hz 45 Hz to 100 Hz > 100 Hz to 5 kHz > 5 kHz to 20 kHz > 20 kHz to 50 kHz	$8,5 \cdot 10^{-3} \cdot I$ $6,6 \cdot 10^{-3} \cdot I$ $6 \cdot 10^{-3} \cdot I$ $6,1 \cdot 10^{-3} \cdot I$ $7,7 \cdot 10^{-3} \cdot I$ $18 \cdot 10^{-3} \cdot I$	
	1 A to 30 A	1 Hz to 1 kHz > 1 kHz to 5 kHz	$3,2 \cdot 10^{-3} \cdot I$ $53 \cdot 10^{-3} \cdot I$	
AC current Current clamps	20 A to 1000 A	45 Hz to 65 Hz > 65 Hz to 440 Hz	$7,8 \cdot 10^{-3} \cdot I$ $13 \cdot 10^{-3} \cdot I$	<i>I</i> = set value with Fluke 5520A / 5500A-Coil only Toroidal-type Clamps
	20 A to 1000 A	45 Hz to 65 Hz > 65 Hz to 440 Hz	$49 \cdot 10^{-3} \cdot I$ $53 \cdot 10^{-3} \cdot I$	

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AC current Current clamps	100 A to 6000 A	10 Hz to 300 Hz > 300 Hz to 500 Hz	$15 \cdot 10^{-3} \cdot I$ $49 \cdot 10^{-3} \cdot I$	with Fluke 52120A / 52120A-Coil
DC resistance Fixed values	0 Ω	2-wire-short 4-wire-short	0,5 m Ω 0,4 $\mu\Omega$	Calibration is performed at the nominal values of the standards
	10 $\mu\Omega$		2 $\mu\Omega$	
	100 $\mu\Omega$		5 $\mu\Omega$	
	1 m Ω		10 $\mu\Omega$	
	10 m Ω 100 k Ω		20 $\mu\Omega$ 5 Ω	
DC resistance Measuring instruments	0 Ω to < 11 Ω	4-wire-connection	$0,2 \cdot 10^{-3} \cdot R + 1,1 \text{ m}\Omega$	R = set value with Fluke 5520A
	11 Ω to < 33 Ω	4-wire-connection	$0,16 \cdot 10^{-3} \cdot R$	
	33 Ω to < 110 Ω	4-wire-connection	$70 \cdot 10^{-6} \cdot R$	
	110 Ω to < 330 Ω	4-wire-connection	$48 \cdot 10^{-6} \cdot R$	
	0,33 k Ω to < 1,1 k Ω	4-wire-connection	$37 \cdot 10^{-6} \cdot R$	
	1,1 k Ω to < 3,3 k Ω	4-wire-connection	$47 \cdot 10^{-6} \cdot R$	
	3,3 k Ω to < 11 k Ω	4-wire-connection	$37 \cdot 10^{-6} \cdot R$	
	11 k Ω to < 33 k Ω	4-wire-connection	$47 \cdot 10^{-6} \cdot R$	
	33 k Ω to < 110 k Ω	4-wire-connection	$37 \cdot 10^{-6} \cdot R$	
	110 k Ω to < 330 k Ω	2-wire-connection	$52 \cdot 10^{-6} \cdot R$	
	0,33 M Ω to < 1,1 M Ω	2-wire-connection	$43 \cdot 10^{-6} \cdot R$	
	1,1 M Ω to < 3,3 M Ω	2-wire-connection	$0,1 \cdot 10^{-3} \cdot R$	
	3,3 M Ω to < 11 M Ω	2-wire-connection	$0,15 \cdot 10^{-3} \cdot R$	
	11 M Ω to < 33 M Ω	2-wire-connection	$0,48 \cdot 10^{-3} \cdot R$	
	33 M Ω to < 110 M Ω	2-wire-connection	$0,8 \cdot 10^{-3} \cdot R$	
110 M Ω to < 330 M Ω 0,33 G Ω to 1,1 G Ω	2-wire-connection 2-wire-connection	$3,8 \cdot 10^{-3} \cdot R$ $16 \cdot 10^{-3} \cdot R$		
DC resistance Sources	0 Ω to 12 Ω	4-wire-connection	$30 \cdot 10^{-6} \cdot R + 30 \mu\Omega$	R = set value with Agilent 3458A
	> 12 Ω to 120 Ω	4-wire-connection	$20 \cdot 10^{-6} \cdot R$	
	> 0,12 k Ω to 1,2 k Ω	4-wire-connection	$11 \cdot 10^{-6} \cdot R$	
	> 1,2 k Ω to 12 k Ω	4-wire-connection	$10 \cdot 10^{-6} \cdot R$	
	> 12 k Ω to 120 k Ω	4-wire-connection	$11 \cdot 10^{-6} \cdot R$	
	> 0,12 M Ω to 1,2 M Ω	4-wire-connection	$17 \cdot 10^{-6} \cdot R$	
	> 1,2 M Ω to 12 M Ω	4-wire-connection	$50 \cdot 10^{-6} \cdot R$	
	> 12 M Ω to 120 M Ω > 0,12 G Ω to 1,2 G Ω	4-wire-connection 4-wire-connection	$1,6 \cdot 10^{-3} \cdot R$ $6,5 \cdot 10^{-3} \cdot R$	
Time and frequency Frequency Measuring instruments	0,1 Hz to < 10 Hz		$50 \cdot 10^{-3} \cdot f + 500 \mu\text{Hz}$	f = set value with Fluke 5520A
	10 Hz to < 50 MHz		$0,55 \cdot 10^{-3} \cdot f$	
	50 MHz to < 500 MHz		$0,12 \cdot 10^{-3} \cdot f$	
	0,5 GHz to 1,1 GHz		$12 \cdot 10^{-6} \cdot f$	
Frequency Sources	1 mHz to < 10 kHz		$1 \cdot 10^{-6} \cdot f + 0,23 \mu\text{Hz}$	f = measuring value with Agilent 53220A
	10 kHz to 6 GHz		$1 \cdot 10^{-6} \cdot f$	
Time interval Measuring instruments	1 ns to 0,1 s		$0,55 \cdot 10^{-3} \cdot t$	t = time interval with Fluke 5520A
	> 0,1 s to 10 s		$59 \cdot 10^{-3} \cdot t + 0,1 \text{ ms}$	

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Time interval Sources	1 ns to 0,1 ms > 0,1 ms to 1000 s		$4,8 \cdot 10^{-6} \cdot t$ $0,24 \cdot 10^{-3} \cdot t + 0,1 \mu\text{s}$	t = time interval with Agilent 53220A
Oscilloscope quantities Vertical deflection	1 mV _{PP} to < 25 mV _{PP} 25 mV _{PP} to < 110 mV _{PP} 0,11 V _{PP} to < 2,2 V _{PP} 2,2 V _{PP} to < 6,6 V _{PP}	10 Hz to 10 kHz	$3 \cdot 10^{-3} \cdot U + 38 \mu\text{V}$ $4,2 \cdot 10^{-3} \cdot U$ $3,2 \cdot 10^{-3} \cdot U$ $2,7 \cdot 10^{-3} \cdot U$	U = set value with Fluke 552x A- SC600 / SC1100 Square wave voltage $R_i = 50 \Omega$ R_i = internal resistance V_{PP} = Peak-to-Peak value of the voltage amplitude
	1 mV _{PP} to < 25 mV _{PP} 25 mV _{PP} to < 110 mV _{PP} 0,11 V _{PP} to < 2,2 V _{PP} 2,2 V _{PP} to < 11 V _{PP} 11 V _{PP} to < 130 V _{PP}	10 Hz to 10 kHz	$3 \cdot 10^{-3} \cdot U + 38 \mu\text{V}$ $2,9 \cdot 10^{-3} \cdot U$ $2 \cdot 10^{-3} \cdot U$ $1,5 \cdot 10^{-3} \cdot U$ $1,8 \cdot 10^{-3} \cdot U$	U = set value with Fluke 552x A- SC600 / SC1100 Square wave voltage $R_i = 1 \text{ M}\Omega$
Horizontal deflection	1 ns to 20 ms > 20 ms to 5 s		$550 \cdot 10^{-6} \cdot t$ $280 \cdot 10^{-6} \cdot t$	with Fluke 552x A- SC600 / SC1100 (Time Marker)
Frequency response	5 mV to < 0,4 V	50 kHz to 100 MHz > 100 MHz to 300 MHz > 300 MHz to 600 MHz > 600 MHz to 1 GHz	$98 \cdot 10^{-3} \cdot U$ $103 \cdot 10^{-3} \cdot U$ $122 \cdot 10^{-3} \cdot U$ $132 \cdot 10^{-3} \cdot U$	U = set value with Fluke 552x A- SC600 / SC1100 (Leveled Sinewave)
	0,4 V to 5,5 V	50 kHz to 100 MHz > 100 MHz to 300 MHz > 300 MHz to 600 MHz	$36 \cdot 10^{-3} \cdot U$ $41 \cdot 10^{-3} \cdot U$ $61 \cdot 10^{-3} \cdot U$	$R_i = 50 \Omega$
	0,4 V to 3,5 V	600 MHz to 1 GHz	$71 \cdot 10^{-3} \cdot U$	
Band width	50 MHz to 100 MHz > 100 MHz to 300 MHz > 300 MHz to 600 MHz > 600 MHz to 1,1 GHz	0,4 V to 5,5 V	$71 \cdot 10^{-3} \cdot f$ $24 \cdot 10^{-3} \cdot f$ $21 \cdot 10^{-3} \cdot f$ $15 \cdot 10^{-3} \cdot f$	f = set value with Fluke 552x A- SC600 / SC1100 (Leveled Sinewave)
Rise time	1 ns to 1 ms	5 mV to 2,5 V 1 kHz to 10 MHz	$80 \cdot 10^{-3} \cdot t$	t = set value with Fluke 5520 A (Edge characteristics) $R_i = 50 \Omega$ Calibration at the nominal values

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On-site Calibration

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DC and low frequency quantities				
DC current Sources	30 A to 500 A > 500 A to 2000 A		$4,9 \cdot 10^{-3} \cdot I$	I = measuring value with Agilent 3458A / Shunt
AC current Sources	30 A to 2000 A	45 Hz to 65 Hz	$21 \cdot 10^{-3} \cdot I$	Clip-on current transformers

Abbreviations used:

- CMC Calibration and measurement capabilities
- DKD-R Guideline of Deutscher Kalibrierdienst (DKD), published by the Physikalisch-Technischen Bundesanstalt

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