

of **D.A.R.E!! Calibrations B.V.**

Woerden

Valid from: **02-06-2004** until **17-01-2005**

Replaces annex dated: **16-07-2003**

Measured quantity, range	Frequency	Best measurement capabilities ($k=2$)	Remarks
1. ELECTRICITY			
1.1 DC/LF Quantities			
1.1.1 Voltage			
1.1.1.1 DC Voltage			
0 - 2 mV		$6 \cdot 10^{-6} \cdot U + 0,9 \mu\text{V}$	Generating
2 - 20 mV		$7 \cdot 10^{-6} \cdot U + 0,9 \mu\text{V}$	
20 mV - 200 mV		$9 \cdot 10^{-6} \cdot U + 0,8 \mu\text{V}$	
200 mV - 2 V		$7 \cdot 10^{-6} \cdot U + 1,2 \mu\text{V}$	
2 V - 20 V		$5 \cdot 10^{-6} \cdot U + 0,8 \mu\text{V}$	
20 V - 200 V		$7 \cdot 10^{-6} \cdot U + 0,06 \text{ mV}$	
200 V - 1000 V		$9 \cdot 10^{-6} \cdot U + 0,6 \text{ mV}$	
0- 200 mV		$7 \cdot 10^{-6} \cdot U + 0,8 \mu\text{V}$	Measuring
200 mV - 2 V		$8 \cdot 10^{-6} \cdot U + 1,0 \mu\text{V}$	
2 V - 20 V		$7 \cdot 10^{-6} \cdot U + 7 \mu\text{V}$	
20 V - 200 V		$1,2 \cdot 10^{-5} \cdot U + 0,08 \text{ mV}$	
200 V - 1000 V		$1,2 \cdot 10^{-5} \cdot U + 0,8 \text{ mV}$	
1.1.1.2 AC Voltage			
0 - 2 mV	30 Hz - 10 kHz	$1,2 \cdot 10^{-3} \cdot U + 6 \mu\text{V}$	Generating, 2-wire
	10 - 33 kHz	$1,3 \cdot 10^{-3} \cdot U + 6 \mu\text{V}$	
	33 - 100 kHz	$1,6 \cdot 10^{-3} \cdot U + 6 \mu\text{V}$	
2 mV - 20 mV	30 - 32 Hz	$2,7 \cdot 10^{-4} \cdot U + 6 \mu\text{V}$	
	32 - 330 Hz	$2,3 \cdot 10^{-4} \cdot U + 6 \mu\text{V}$	
	330 - 3300 Hz	$2,1 \cdot 10^{-4} \cdot U + 6 \mu\text{V}$	
	3,3 - 10 kHz	$2,3 \cdot 10^{-4} \cdot U + 6 \mu\text{V}$	
	10 - 33 kHz	$3,1 \cdot 10^{-4} \cdot U + 6 \mu\text{V}$	
	33 - 100 kHz	$6 \cdot 10^{-4} \cdot U + 6 \mu\text{V}$	
20 mV - 200 mV	30 - 32 Hz	$1,9 \cdot 10^{-4} \cdot U + 10 \mu\text{V}$	
	32 - 3300 Hz	$1,2 \cdot 10^{-4} \cdot U + 10 \mu\text{V}$	
	3,3 - 10 kHz	$1,4 \cdot 10^{-4} \cdot U + 10 \mu\text{V}$	
	10 - 33 kHz	$4 \cdot 10^{-3} \cdot U + 10 \mu\text{V}$	
	33 - 100 kHz	$5 \cdot 10^{-4} \cdot U + 10 \mu\text{V}$	

This annex has been approved by:

Ir. J.C. van der Poel
Chief Executive

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90 mV - 2V	30 - 32 Hz	$1,0 \cdot 10^{-4} \cdot U + 60 \mu\text{V}$	Generating, 4-wire	
	32 - 330 Hz	$6 \cdot 10^{-5} \cdot U + 50 \mu\text{V}$		
	330 Hz - 33 kHz	$4 \cdot 10^{-5} \cdot U + 50 \mu\text{V}$		
	33 - 100 kHz	$9 \cdot 10^{-5} \cdot U + 300 \mu\text{V}$		
	100 - 330 kHz	$4 \cdot 10^{-4} \cdot U + 1,1 \text{ mV}$		
	330 kHz - 1 MHz	$1,8 \cdot 10^{-4} \cdot U + 3,5 \text{ mV}$		
2 V - 20 V	30 - 32 Hz	$1,0 \cdot 10^{-4} \cdot U + 600 \mu\text{V}$		
	32 - 330 Hz	$6 \cdot 10^{-5} \cdot U + 500 \mu\text{V}$		
	330 Hz - 33 kHz	$5 \cdot 10^{-5} \cdot U + 500 \mu\text{V}$		
	33 - 100 kHz	$9 \cdot 10^{-5} \cdot U + 3 \text{ mV}$		
	100 - 330 kHz	$2,4 \cdot 10^{-4} \cdot U + 11 \text{ mV}$		
	330 kHz - 1 MHz	$1,5 \cdot 10^{-3} \cdot U + 35 \text{ mV}$		
20 V - 200 V	30 - 32 Hz	$1,0 \cdot 10^{-4} \cdot U + 9 \text{ mV}$		
	32 - 330 Hz	$6 \cdot 10^{-6} \cdot U + 9 \text{ mV}$		
	330 Hz - 10 kHz	$4 \cdot 10^{-5} \cdot U + 9 \text{ mV}$		
	10 - 33 kHz	$5 \cdot 10^{-5} \cdot U + 9 \text{ mV}$		
	33 - 100 kHz	$1,2 \cdot 10^{-4} \cdot U + 33 \text{ mV}$		
	200 V - 1000 V	50 - 330 Hz		$1,4 \cdot 10^{-4} \cdot U + 90 \text{ mV}$
330 - 3300 Hz		$9 \cdot 10^{-5} \cdot U + 90 \text{ mV}$		
3,3 - 10 kHz		$1,3 \cdot 10^{-4} \cdot U + 90 \text{ mV}$		
10 - 33 kHz		$1,4 \cdot 10^{-4} \cdot U + 90 \text{ mV}$		
2 mV - 200 mV		20 - 40 Hz	$3 \cdot 10^{-4} \cdot U + 5 \mu\text{V}$	Measuring
		40 - 2000 Hz	$2,8 \cdot 10^{-4} \cdot U + 5 \mu\text{V}$	
	2 - 3 kHz	$2,7 \cdot 10^{-4} \cdot U + 7 \mu\text{V}$		
	3 - 10 kHz	$2,7 \cdot 10^{-4} \cdot U + 5 \mu\text{V}$		
	10 - 30 kHz	$5 \cdot 10^{-4} \cdot U + 9 \mu\text{V}$		
	30 - 100 kHz	$9 \cdot 10^{-4} \cdot U + 23 \mu\text{V}$		
200 mV - 2 V	20 - 40 Hz	$2,1 \cdot 10^{-4} \cdot U + 23 \mu\text{V}$		
	40 - 100 Hz	$1,9 \cdot 10^{-4} \cdot U + 23 \mu\text{V}$		
	100 - 300 Hz	$1,7 \cdot 10^{-4} \cdot U + 23 \mu\text{V}$		
	300 - 1000 Hz	$1,6 \cdot 10^{-4} \cdot U + 23 \mu\text{V}$		
	1 - 3 kHz	$1,8 \cdot 10^{-4} \cdot U + 23 \mu\text{V}$		
	3 - 10 kHz	$3 \cdot 10^{-4} \cdot U + 50 \mu\text{V}$		
	10 - 60 kHz	$6 \cdot 10^{-4} \cdot U + 230 \mu\text{V}$		
	60 - 100 kHz	$3,5 \cdot 10^{-4} \cdot U + 2,3 \text{ mV}$		
	100 - 300 kHz	$3,7 \cdot 10^{-4} \cdot U + 2,3 \text{ mV}$		
	300 kHz - 1 MHz	$1,2 \cdot 10^{-2} \cdot U + 23 \text{ mV}$		
2 V - 20 V	20 - 40 Hz	$2,1 \cdot 10^{-4} \cdot U + 230 \mu\text{V}$		
	40 - 100 Hz	$1,9 \cdot 10^{-4} \cdot U + 230 \mu\text{V}$		
	100 - 300 Hz	$1,7 \cdot 10^{-4} \cdot U + 230 \mu\text{V}$		
	300 - 2000 Hz	$1,6 \cdot 10^{-4} \cdot U + 230 \mu\text{V}$		
	2 - 10 kHz	$1,8 \cdot 10^{-4} \cdot U + 230 \mu\text{V}$		
	10 - 30 kHz	$3 \cdot 10^{-4} \cdot U + 50 \mu\text{V}$		
	30 - 60 kHz	$6 \cdot 10^{-4} \cdot U + 2,3 \text{ mV}$		
	60 - 100 kHz	$3,5 \cdot 10^{-4} \cdot U + 23 \text{ mV}$		
	100 - 300 kHz	$3,7 \cdot 10^{-4} \cdot U + 23 \text{ mV}$		

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20 V - 200 V	300 kHz - 1 MHz 20 - 40 Hz 40 - 100 Hz 100 - 300 Hz 300 - 3000 Hz	$1,2 \cdot 10^{-2} \cdot U + 230$ mV $2,2 \cdot 10^{-4} \cdot U + 2,3$ mV $1,9 \cdot 10^{-4} \cdot U + 2,2$ mV $1,7 \cdot 10^{-4} \cdot U + 2,3$ mV $1,6 \cdot 10^{-4} \cdot U + 2,3$ mV	
200 V - 1000 V	3 - 10 kHz 10 - 30 kHz 30 - 100 kHz 40 Hz - 10 kHz 10 - 30 kHz	$1,8 \cdot 10^{-4} \cdot U + 2,3$ mV $3 \cdot 10^{-4} \cdot U + 5$ mV $7 \cdot 10^{-4} \cdot U + 23$ mV $1,6 \cdot 10^{-3} \cdot U$ $1,7 \cdot 10^{-3} \cdot U$	
1.1.2 Current			
1.1.2.1 DC Current			
0 - 200 μ A		$1,2 \cdot 10^{-4} \cdot I + 5$ nA	Generating
200 μ A - 2 mA		$5 \cdot 10^{-5} \cdot I + 12$ nA	
2 - 20 mA		$5 \cdot 10^{-5} \cdot I + 120$ nA	
20 - 200 mA		$5 \cdot 10^{-5} \cdot I + 1,2$ μ A	
200 mA - 2 A		$1,2 \cdot 10^{-4} \cdot I + 23$ μ A	
0 - 200 μ A		$1,2 \cdot 10^{-4} \cdot I + 5$ nA	Measuring
200 μ A - 2 mA		$1,2 \cdot 10^{-4} \cdot I + 50$ nA	
2 - 20 mA		$1,2 \cdot 10^{-4} \cdot I + 0,5$ μ A	
20 - 200 mA		$1,2 \cdot 10^{-4} \cdot I + 5$ μ A	
200 mA - 2 A		$2,4 \cdot 10^{-4} \cdot I + 50$ μ A	
1.1.2.2 AC Current			
10 - 200 μ A	10 - 32 Hz 32 - 330 Hz 340 - 1000 Hz	$2,3 \cdot 10^{-4} \cdot I + 12$ nA $1,9 \cdot 10^{-3} \cdot I + 11$ nA $6 \cdot 10^{-3}$	Generating
200 μ A - 2 mA	10 - 32 Hz 32 - 330 Hz 330 - 1000 Hz	$1,6 \cdot 10^{-4} \cdot I + 110$ nA $1,6 \cdot 10^{-4} \cdot I + 120$ nA $1,5 \cdot 10^{-4} \cdot I + 120$ nA	
2 mA - 20 mA	1 - 3,3 kHz 3,3 - 5 kHz 10 - 32 Hz 32 - 330 Hz 330 - 1000 Hz	$2,6 \cdot 10^{-4} \cdot I + 120$ nA $2,7 \cdot 10^{-4} \cdot I + 120$ nA $1,6 \cdot 10^{-4} \cdot I + 1,1$ μ A $1,6 \cdot 10^{-4} \cdot I + 1,2$ μ A $1,4 \cdot 10^{-4} \cdot I + 1,2$ μ A	
20 mA - 200 mA	1 - 3,3 kHz 3,3 - 5 kHz 10 - 32 Hz 32 - 330 Hz 330 - 1000 Hz	$2,6 \cdot 10^{-4} \cdot I + 1,2$ μ A $2,7 \cdot 10^{-4} \cdot I + 1,2$ μ A $1,6 \cdot 10^{-4} \cdot I + 11$ μ A $1,6 \cdot 10^{-4} \cdot I + 12$ μ A $1,4 \cdot 10^{-4} \cdot I + 12$ μ A	
200 mA - 2 A	1 - 3,3 kHz 3,3 - 5 kHz 10 - 32 Hz 32 - 330 Hz 330 - 1000 Hz 1 - 3,3 kHz 3,3 - 5 kHz	$2,6 \cdot 10^{-4} \cdot I + 12$ μ A $2,7 \cdot 10^{-4} \cdot I + 12$ μ A $4 \cdot 10^{-4} \cdot I + 120$ μ A $6 \cdot 10^{-4} \cdot I + 120$ μ A $1,6 \cdot 10^{-3}$ $5 \cdot 10^{-3}$ $8 \cdot 10^{-3}$	

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10 μ A - 200 μ A	50 - 1000 Hz	$3,8 \cdot 10^{-4} \cdot I + 23$ nA	Measuring	
200 μ A - 2 mA	1 - 5 kHz	$7 \cdot 10^{-4} \cdot I + 23$ nA		
	50 - 300 Hz	$3,6 \cdot 10^{-4} \cdot I + 230$ nA		
	300 - 1000 Hz	$3,7 \cdot 10^{-4} \cdot I + 230$ nA		
	1 - 5 kHz	$7 \cdot 10^{-4} \cdot I + 230$ nA		
2 mA - 20 mA	50 - 300 Hz	$3,6 \cdot 10^{-4} \cdot I + 2,3$ μ A		
	300 - 1000 Hz	$3,8 \cdot 10^{-4} \cdot I + 2,3$ μ A		
	1 - 5 kHz	$7 \cdot 10^{-4} \cdot I + 2,3$ μ A		
20 mA - 200 mA	50 - 1000 Hz	$3,6 \cdot 10^{-4} \cdot I + 23$ μ A		
	1 - 5 kHz	$7 \cdot 10^{-4} \cdot I + 23$ μ A		
200 mA - 2 A	50 - 1000 Hz	$7 \cdot 10^{-4} \cdot I + 0,5$ mA		
	1 - 5 kHz	$2,3 \cdot 10^{-3} \cdot I + 1,2$ mA		
1.1.6 Resistance				
1.1.6.1 DC resistance				
1 Ω		0,2 m Ω	Generating, 4-wire	
10 Ω		0,5 m Ω		
100 Ω		1,9 m Ω		
1 k Ω		21 m Ω		
10 k Ω		0,2 Ω		
100 k Ω		2,3 Ω		
1 M Ω		33 Ω		
10 M Ω		630 Ω		
100 M Ω		22 k Ω		
10 Ω		0,24 Ω		Generating, 2-wire
100 Ω		0,24 Ω		
1 k Ω		0,35 Ω		
10 k Ω		0,5 Ω		
100 k Ω		2,6 Ω		
1 M Ω		33 Ω		
10 M Ω		630 Ω		
100 M Ω		9 k Ω		
0 - 20 Ω		$2,0 \cdot 10^{-5} \cdot R + 0,12$ m Ω	Measuring, 4-wire	
20 - 200 Ω		$1,5 \cdot 10^{-5} \cdot R + 0,2$ m Ω		
200 - 2000 Ω		$1,2 \cdot 10^{-5} \cdot R + 1,3$ m Ω		
2 - 20 k Ω		$1,2 \cdot 10^{-5} \cdot R + 13$ m Ω		
20 - 200 k Ω		$2,1 \cdot 10^{-5} \cdot R + 110$ m Ω		
200 k Ω - 2 M Ω		$3,1 \cdot 10^{-5} \cdot R + 1,6$ Ω	Measuring, 2-wire	
2 - 20 M Ω		$3,6 \cdot 10^{-5} \cdot R + 100$ Ω		
20 - 200 M Ω		$1,7 \cdot 10^{-4} \cdot R + 10$ k Ω		
200 M Ω - 2 G Ω		$3,5 \cdot 10^{-3} \cdot R + 1,1$ M Ω		

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Measured quantity, range		Frequency	Best measurement capabilities ($k=2$)	Remarks
1.2	High frequency quantities			
1.2.2	Reflection coefficient			Nom. impedance 50 Ω
	Magnitude 0 to 1,0	30 kHz – 1 MHz 1 MHz - 2 GHz 2 GHz - 8 GHz 8 GHz – 18 GHz	$0,005+0,007 \cdot \Gamma+0,005 \cdot \Gamma^2$ $0,005+0,003 \cdot \Gamma+0,005 \cdot \Gamma^2$ $0,02+0,004 \cdot \Gamma+0,02 \cdot \Gamma^2$ $0,03+0,004 \cdot \Gamma+0,04 \cdot \Gamma^2$	at nominal -10 dBm RF power
	Phase -180° to $+180^\circ$	30 kHz -1 8 GHz	$u(\theta) = \arcsin\left(\frac{u(\Gamma)}{ \Gamma }\right)$	If the magnitude is less than its uncertainty, the phase uncertainty is 180°
	Transmission Coefficient			For coaxial 50 Ω devices
	Magnitude 0 to – 40 dB	30 kHz – 1 MHz 1 MHz - 2 GHz 2 GHz - 8 GHz 8 GHz – 18 GHz	0,07 dB 0,03 dB 0,08 dB 0,1 dB	at nom. -10 dBm RF power
	Magn. (–40 to –70)dB	30 kHz – 18 GHz	0,1 dB	at nom. 0 dBm RF power
	Magn. (–70 to –100)dB	30 kHz – 18 GHz	1 dB	at nom. +10 dBm RF power
1.2.3	High Frequency Power			
1.2.3.1	Calibration factors of			
	RF power sensors	30 kHz - 100 kHz	0,08 dB - 0,04 dB	2), at nom. 0 dBm RF power
	RF power sensors	100 kHz - 18 GHz	0,04 dB	2) at nom. 0 dBm RF power
1.2.3.2	Linearity of RF power			
	0 to -10 dBm	30 kHz – 4,2 GHz	0,03 dB	
	0 to -20 dBm	30 kHz – 4,2 GHz	0,05 dB	
	0 to -40 dBm	10 MHz – 18 GHz	0,05 dB	
	0 to -50 dBm	10 MHz – 18 GHz	0,07 dB	
	0 to -60 dBm	10 MHz – 18 GHz	0,09 dB	

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Measured quantity, range	Frequency	Best measurement capabilities ($k=2$)	Remarks
1.2.3.3 Absolute power			
-25 dBm to +10 dBm	30 kHz - 300 kHz	0,51 dB - 0,07 dB	3)
-25 dBm to +10 dBm	300 kHz - 4,2 GHz	0,07 dB	3)
-60 dBm to -20 dBm	10 MHz - 18 GHz	0,09 dB	3)
1.2.3.4 Frequency response of power measuring devices	30 kHz - 18 GHz	0,06 dB	2), at nom. -20 dBm RF power
1.2.3.5 Bandwidth of RBW filters			
1 Hz to 10 MHz	30 kHz - 2,4 GHz	0,8 + 0,02·BW	
1 Hz to 10 MHz	10 MHz - 18 GHz	0,08 + 0,02·BW	
1.2.3.6 Response of CISPR receivers QP and AV	9 kHz - 1 GHz	0,3 dB	3)
1.2.6.1 Electrical fieldstrength			
1 - 200 V/m	100 kHz - 200 MHz	0,06·E	TEM Cell
1 - 30 V/m	200 MHz - 18 GHz	0,15·E	Anechoic chamber
1.2.6.2 Antenna factor			
ANSI C63.5 / CISPR 16	30 MHz – 5 GHz	0,8 dB	OATS, Standard Site method
ANSI C63.5 / CISPR 16	30 MHz – 1 GHz	0,8 dB	OATS, Reference antenna method
1.2.6 - ESD simulators			According to EN 61000-4-2, (March 1995), §6.2 Contact discharge only. (1)
waveform			
discharge current			
0 A to 10 A		0,20 A to 0,36 A	
0 A to 20 A		0,39 A to 0,7 A	
0 A to 50 A		1,0 A to 1,8 A	
rise time (10% - 90%)			
0,6 ns to 1,2 ns		$3,5 \cdot 10^{-2} \cdot t$ to $7 \cdot 10^{-2} \cdot t$	
$i(t)$ @ $t = 30$ ns			
1,7 A to 35 A		0,20 A to 1,4 A	
$i(t)$ @ $t = 60$ ns			

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0,8 A to 17 A		0,20 A to 1,1 A	
- Surge generators and coupling/decoupling networks			According to EN 61000-4-5, (March 1995), §6.1.2, §6.2.2 and §6.3.1
waveform			
surge voltage			
0 V to 0,52 kV		10 V to 17 V	Coupling/decoupling networks for a.c./d.c.
0 V to 1,0 kV		20 V to 33 V	power supply circuits
0 V to 2,1 kV		0,04 kV to 0,07 kV	only in combination with appropriate surge generator.
0 V to 5,2 kV		0,10 kV to 0,17 kV	Measurements at coupling/decoupling network input, output; coupling modes line to neutral, line to earth and neutral to earth.
waveform			
surge current			
0 A to 317 A		5 A to 12 A	
0 A to 0,63 kA		9 A to 23 A	
0 A to 1,3 kA		17 A to 0,05 kA	
0 A to 3,2 kA		0,05 kA to 0,11 kA	
front time			
0,8 μ s to 1,6 μ s		$1,5 \cdot 10^{-1} \cdot t$ to $2,3 \cdot 10^{-1} \cdot t$	current through earth coupling
5 μ s to 11 μ s		$8 \cdot 10^{-2} \cdot t$ to $1,1 \cdot 10^{-1} \cdot t$	
1,3 μ s to 3,1 μ s		$1,2 \cdot 10^{-1} \cdot t$ to $1,5 \cdot 10^{-1} \cdot t$	
rise time (10% - 90%)			
0,7 μ s to 1,3 μ s		$1,1 \cdot 10^{-1} \cdot t$ to $1,7 \cdot 10^{-1} \cdot t$	current through earth coupling
4,5 μ s to 8,3 μ s		$9 \cdot 10^{-2} \cdot t$ to $1,1 \cdot 10^{-1} \cdot t$	
1,1 μ s to 2,5 μ s		$1,2 \cdot 10^{-1} \cdot t$ to $1,5 \cdot 10^{-1} \cdot t$	
time to half-value			
35 μ s to 65 μ s		$5 \cdot 10^{-2} \cdot t$ to $8 \cdot 10^{-2} \cdot t$	voltage across earth coupling current
14 μ s to 26 μ s		$1,4 \cdot 10^{-2} \cdot t$ to $1,5 \cdot 10^{-2} \cdot t$	through earth coupling
20 μ s to 46 μ s		$4 \cdot 10^{-2} \cdot t$ to $8 \cdot 10^{-2} \cdot t$	
18 μ s to 42 μ s		$4 \cdot 10^{-2} \cdot t$ to $5 \cdot 10^{-2} \cdot t$	
pulse duration time (50%-50%)			
35 μ s to 65 μ s		$5 \cdot 10^{-2} \cdot t$ to $8 \cdot 10^{-2} \cdot t$	voltage across earth coupling current
11 μ s to 21 μ s		$1,7 \cdot 10^{-2} \cdot t$ to $1,9 \cdot 10^{-2} \cdot t$	through earth coupling
20 μ s to 46 μ s		$5 \cdot 10^{-2} \cdot t$ to $8 \cdot 10^{-2} \cdot t$	

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10 mHz – 10 Hz 10 Hz – 100 kHz		$3 \cdot 10^{-5} \cdot f$ $(1 \cdot 10^{-5} / \tau) \cdot f$	Generating Generating, $10 \text{ ms} \leq \tau \leq 400\text{s}$
100 kHz – 2,16 GHz		$(1 \cdot 10^{-9} / \tau + 1,8 \cdot 10^{-10}) \cdot f$	Generating, $10 \text{ ms} \leq \tau \leq 400\text{s}$

Remarks:

- 1) The best measurement capability stated in the above table is based on the total measurement uncertainty, not including an uncertainty contribution due to the imperfection of the used IEC target.
- 2) $|\Gamma_{dut}| < 0,02$
- 3) $|\Gamma_{dut}| < 0,2$
- 2),3) All calibrations are based on equipment using N-type connectors. Other connector types are possible (SMA / BNC etc) but this will increase measurement uncertainties

The calibrations are carried out at an ambient temperature of 23°C nominal and a relative humidity of 50% nominal.

The best measurement capability: the highest achievable accuracy for a given measuring point or measuring range, expressed as the total positive and negative measurement uncertainty.

The measurement uncertainty is calculated according to EA-4/02 "Expression of the Uncertainty of Measurement in Calibration".

The measurements are carried out inside the laboratory.