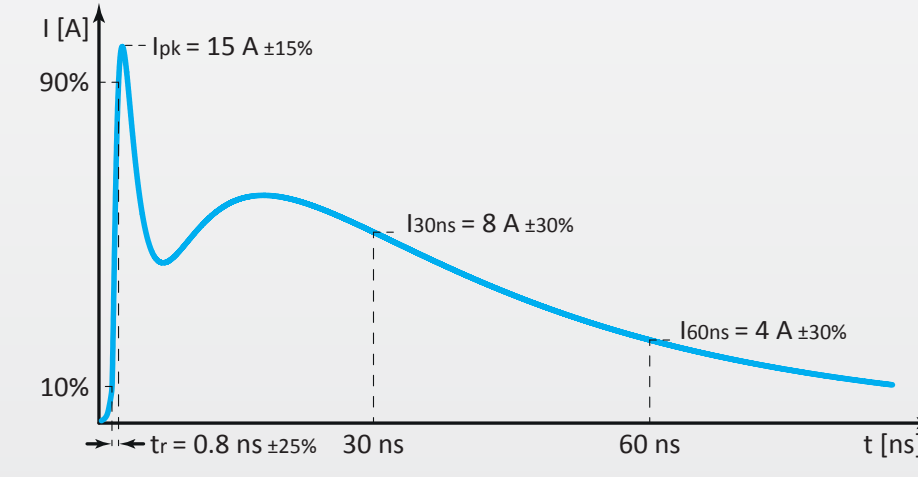


ESD

IEC 61000-4-2

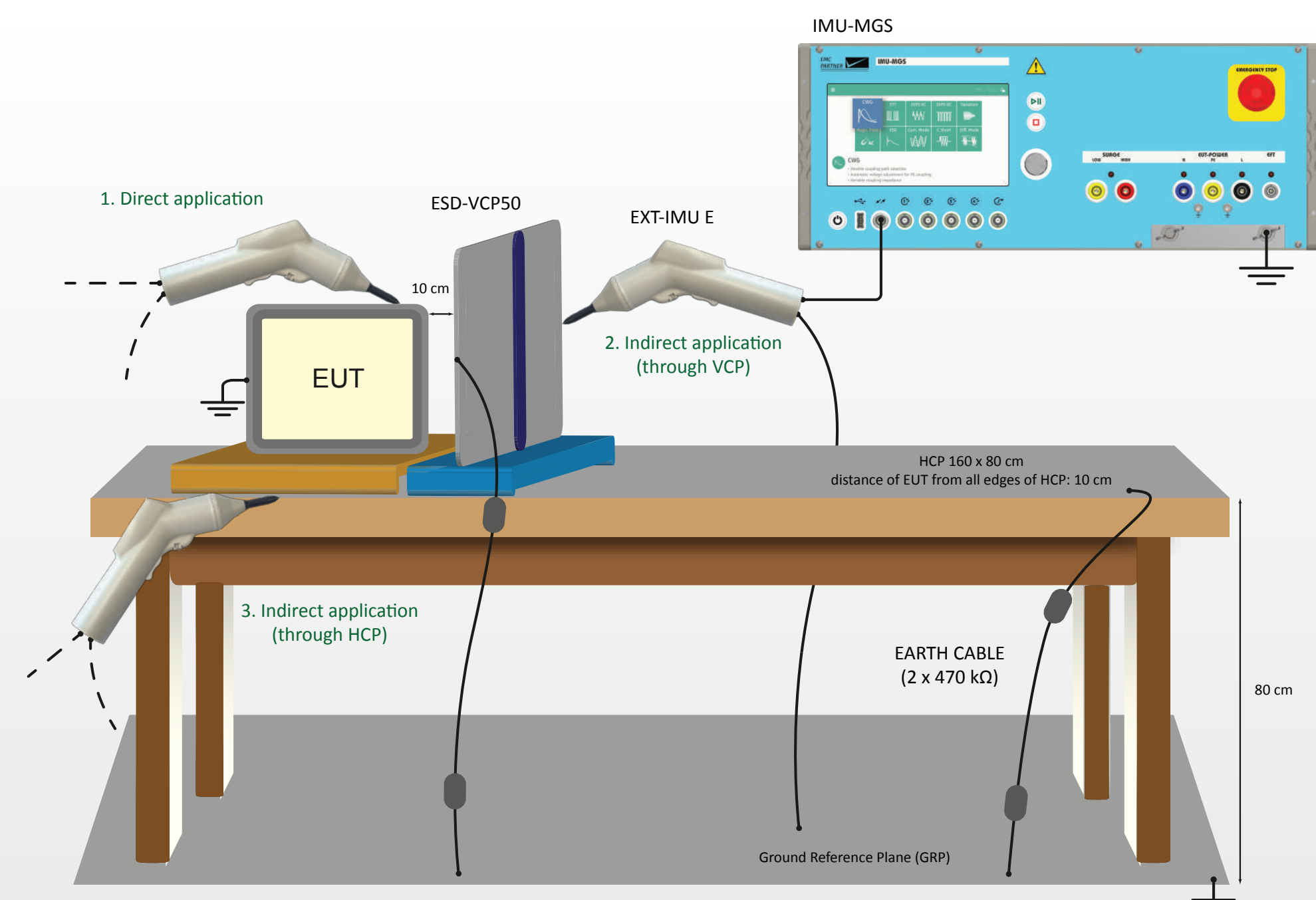
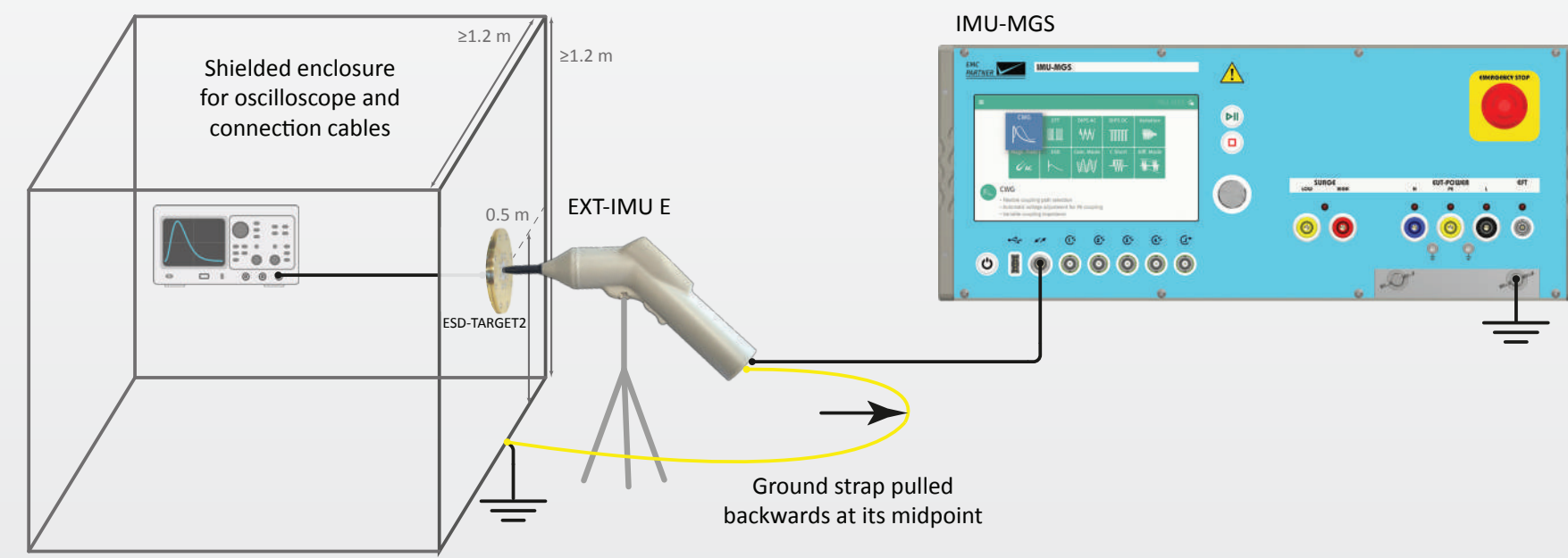
Contact discharge current waveform parameters

Level	V ± 5% [kV]	tr ± 25% [ns]	1st Ipeak ± 15% [A]	Ipeak 30ns ± 30% [A]	Ipeak 60ns ± 30% [A]
1	2	0.8	7.5	4	2
2	4	0.8	15	8	4
3	6	0.8	22.5	12	6
4	8	0.8	30	16	8



Test Levels

Level	Contact Discharge (CD) Upeak [kV]	Air Discharge (AD) Upeak [kV]
1	2	2
2	4	4
3	6	8
4	8	15
X	special	special



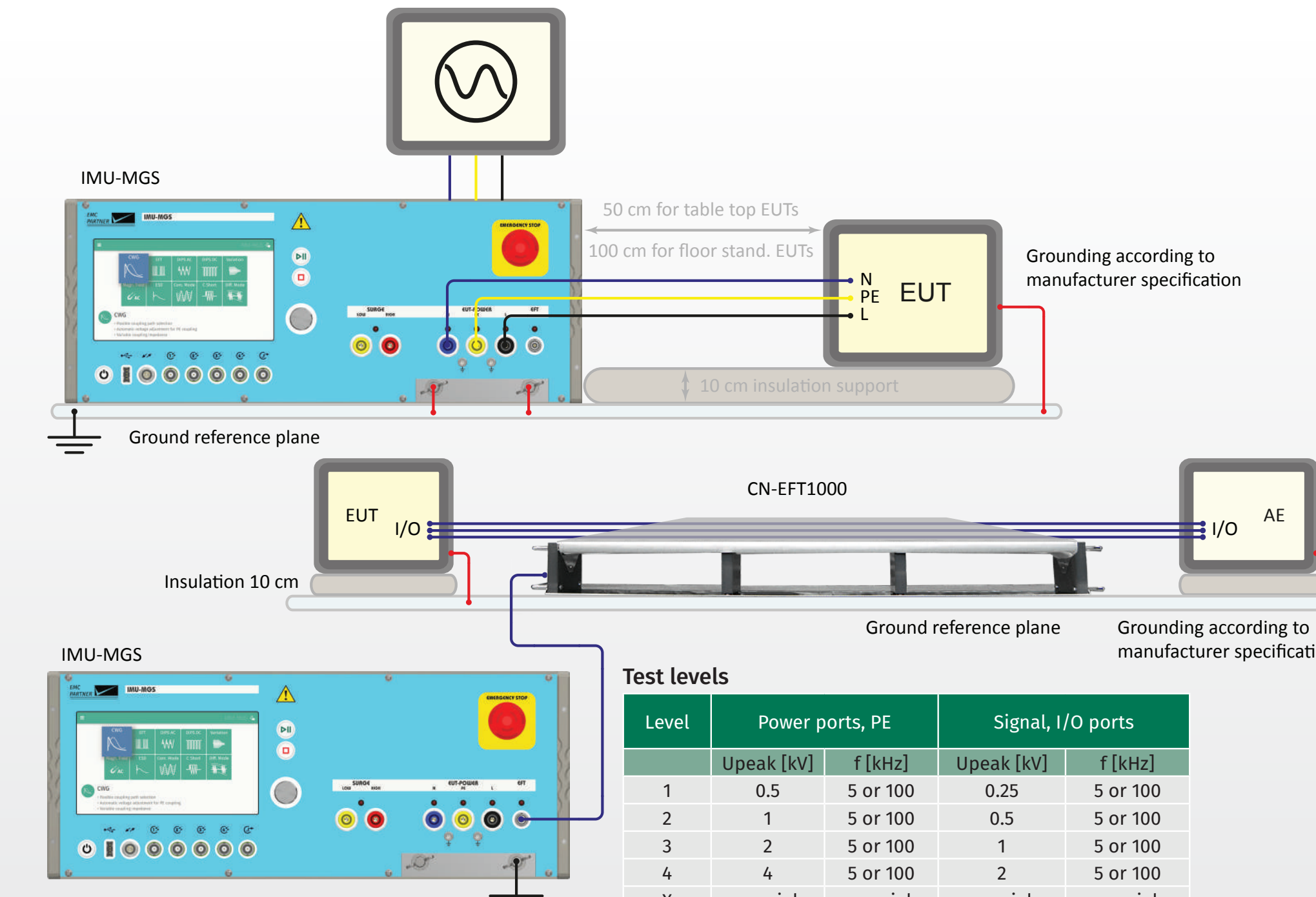
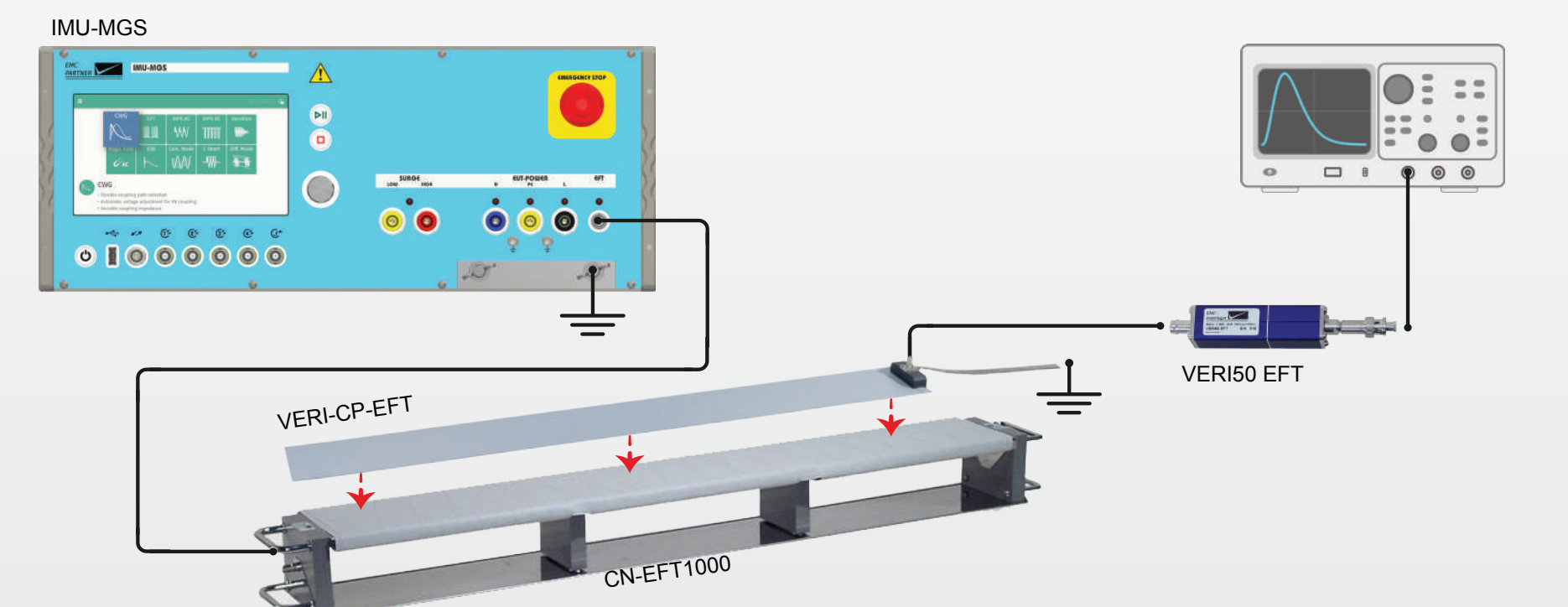
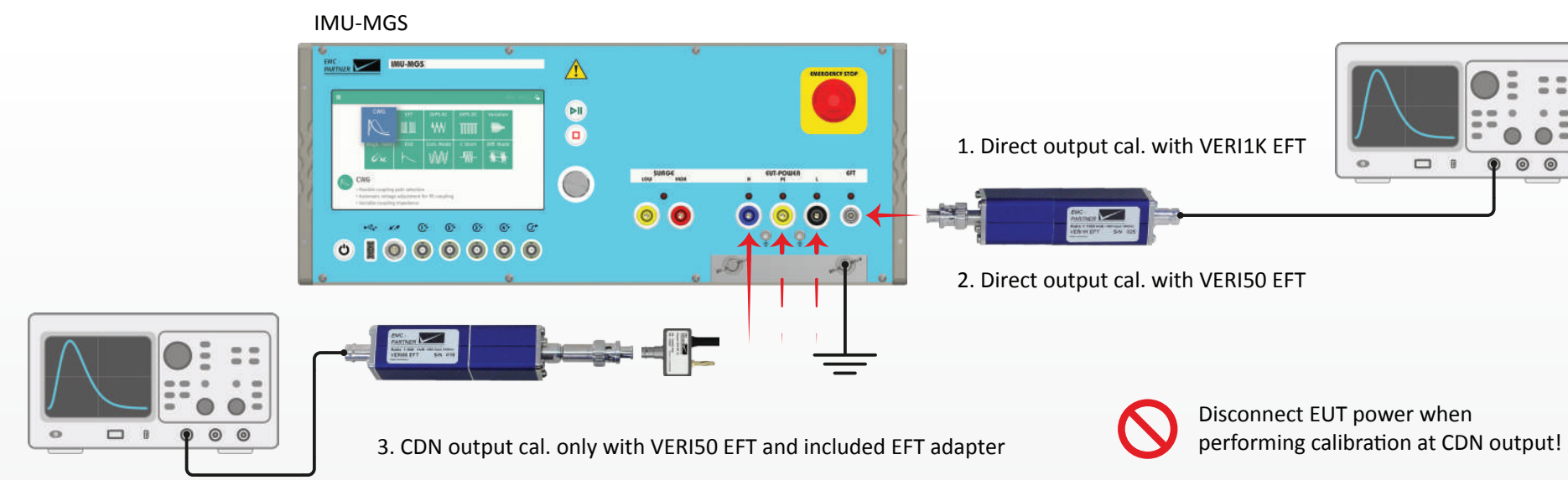
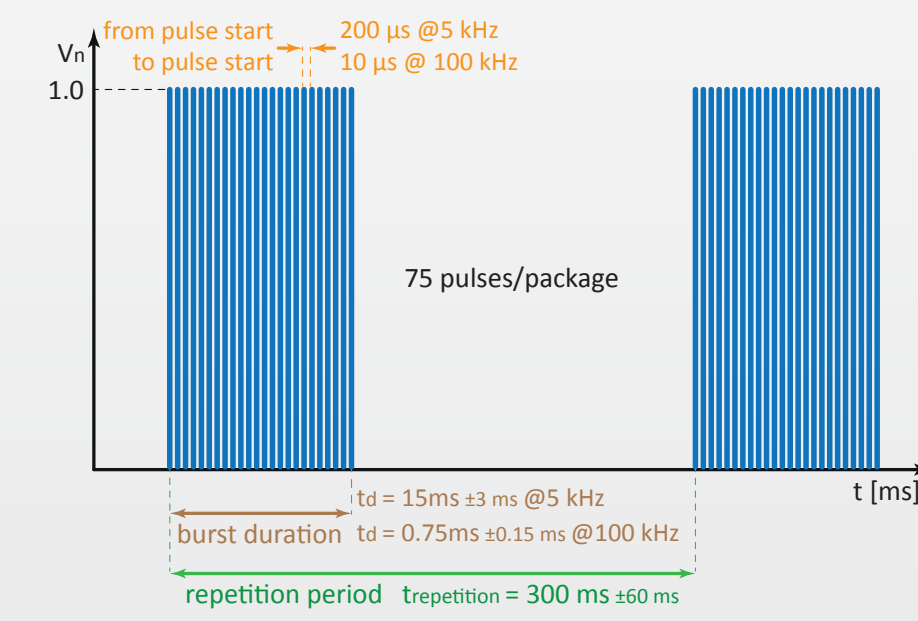
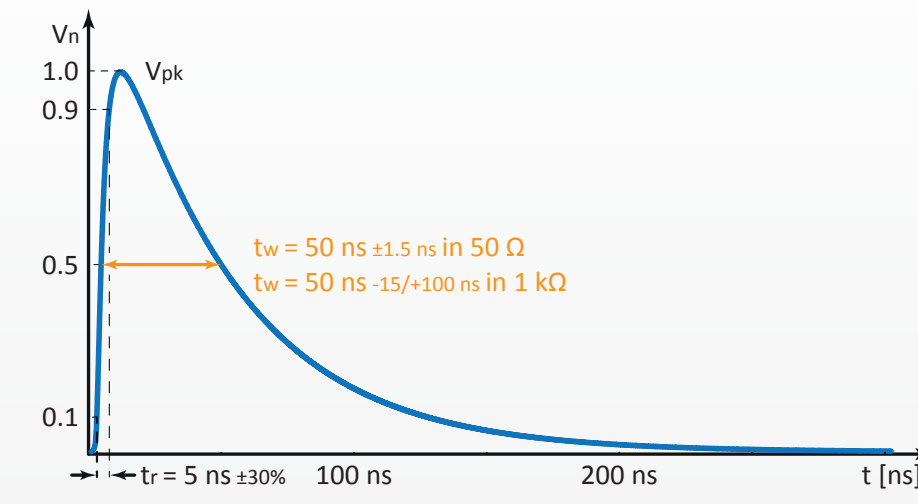
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EFT

IEC 61000-4-4

Calibration levels at output of the generator

Set voltage [kV]	Vp OC [kV]	Vp 1 kOhm [kV]	Vp 50 Ohm [kV]	f [kHz]
0.25	0.25	0.24	0.125	5 or 100
0.5	0.5	0.48	0.25	5 or 100
1	1	0.95	0.5	5 or 100
2	2	1.9	1	5 or 100
4	4	3.8	2	5 or 100

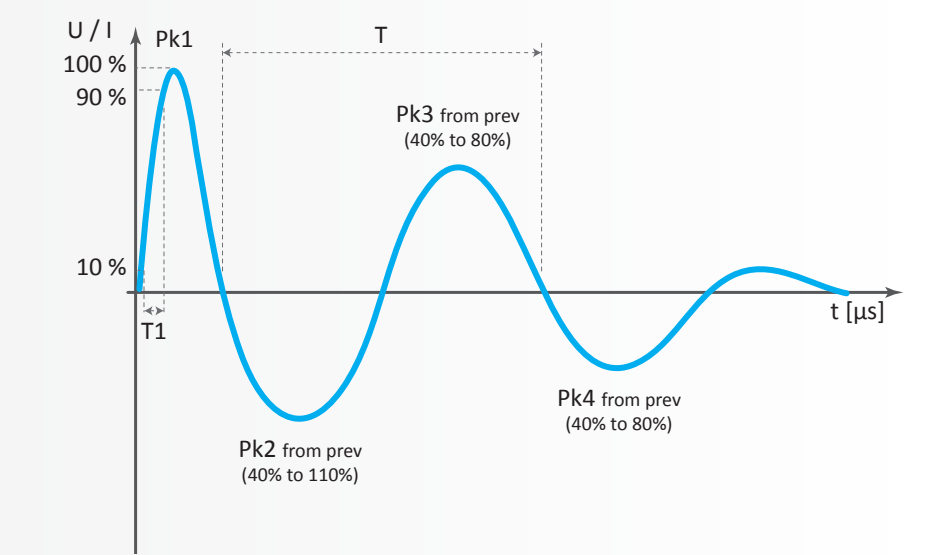


Test levels

Level	Power ports, PE		Signal, I/O ports	
	Upeak [kV]	f [kHz]	Upeak [kV]	f [kHz]
1	0.5	5 or 100	0.25	5 or 100
2	1	5 or 100	0.5	5 or 100
3	2	5 or 100	1	5 or 100
4	4	5 or 100	2	5 or 100
X	special	special	special	special

Ringwave

IEC 61000-4-12

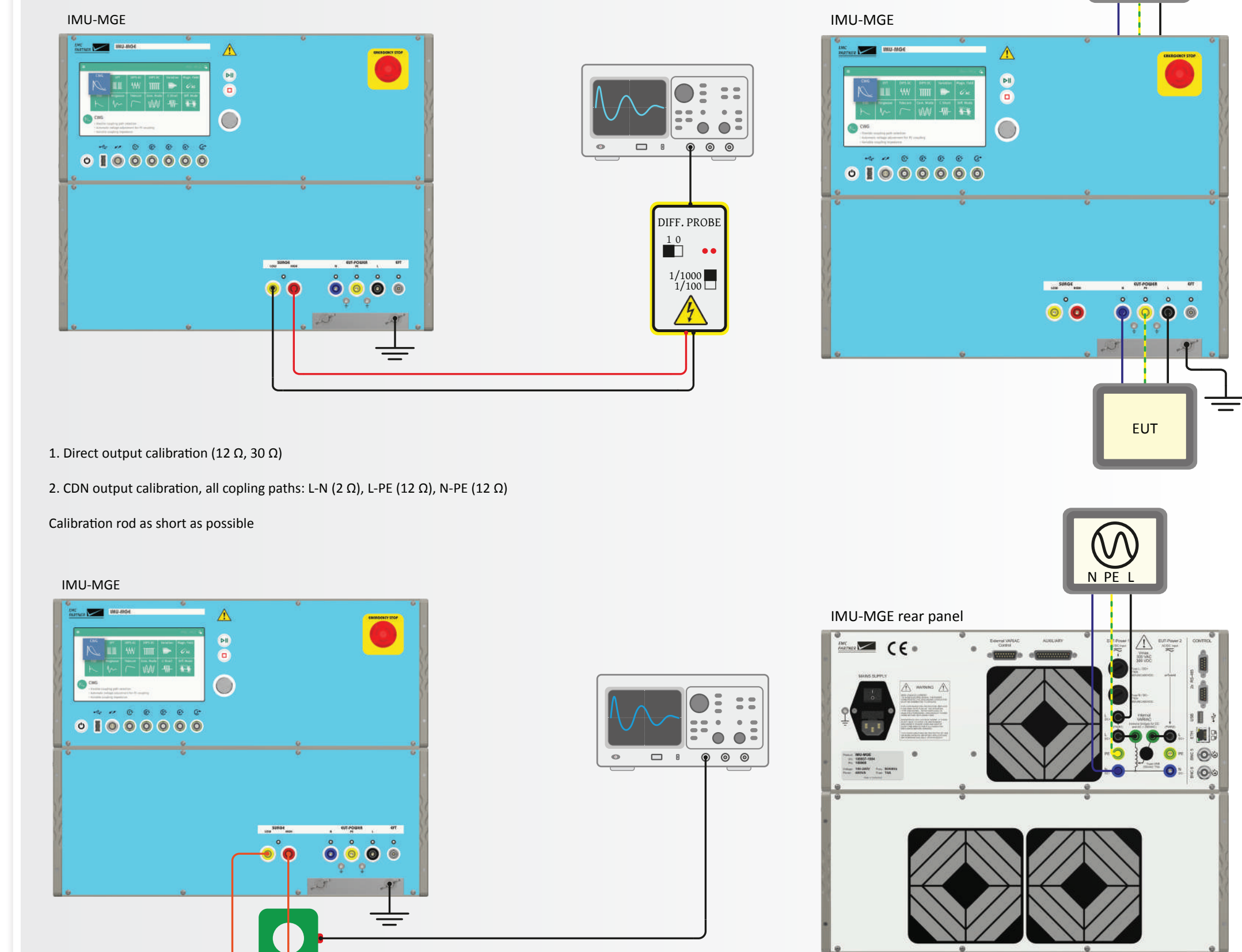


Open circuit voltage, Short circuit current

Upeak [kV] ± 10%	Ipeak [A] ± 10%	Ipeak [A] ± 10%
0.25	20.8	8.3
0.5	41.7	16.7
1	83.3	33.3
2	166.7	66.7
4	333.3	133.3

Level	Line - Line Upeak [kV]	Line - Ground Upeak [kV]
1	0.25	0.5
2	0.5	1
3	1	2
4	2	4
X	special	special

1. Direct output calibration (12 Ω, 30 Ω)
2. CDN output calibration, all coupling paths: L-N (12 Ω), L-PE (12 Ω), N-PE (12 Ω)

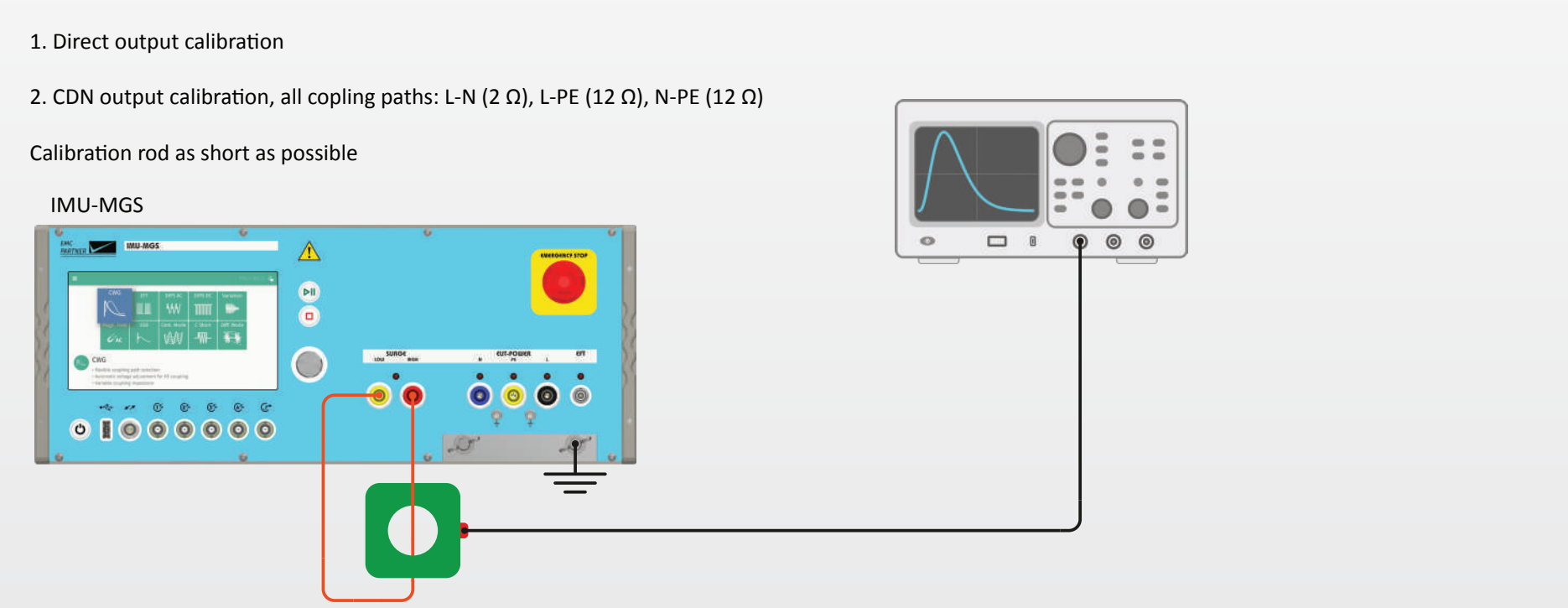
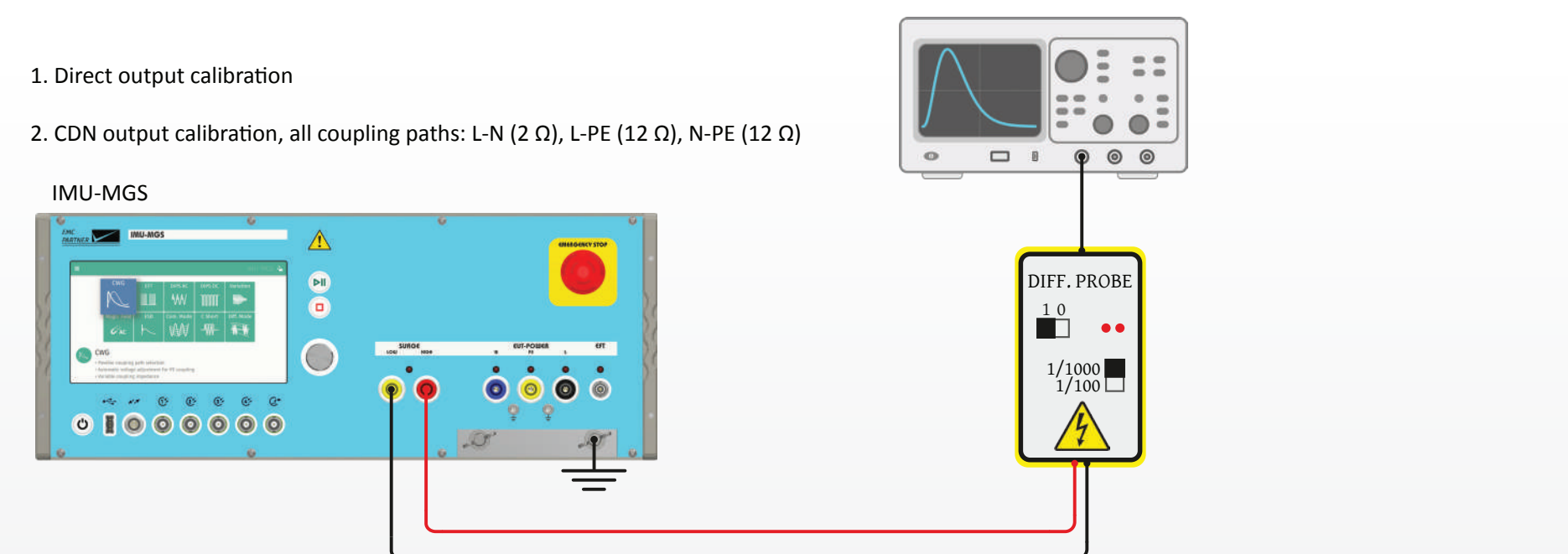
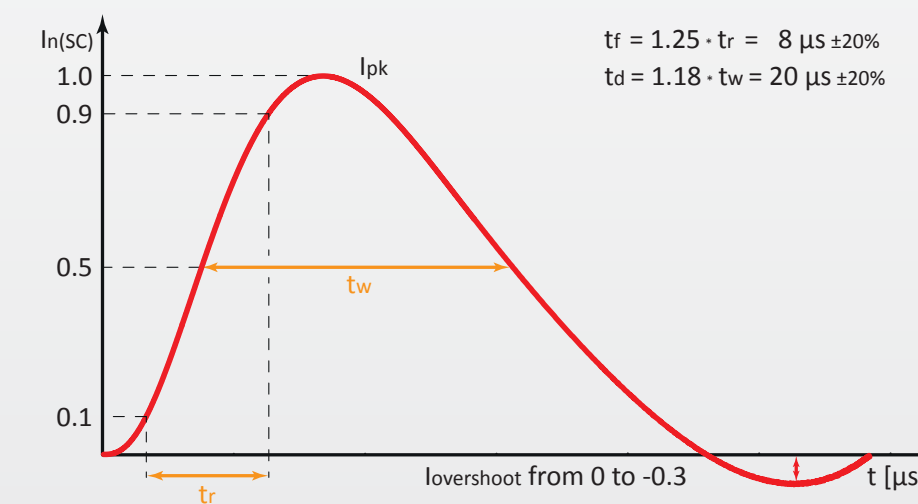
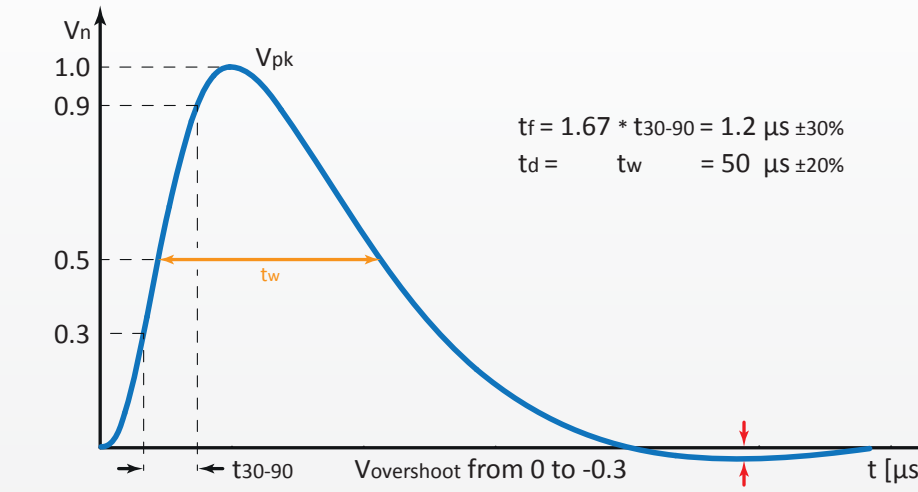


CWG

IEC 61000-4-5

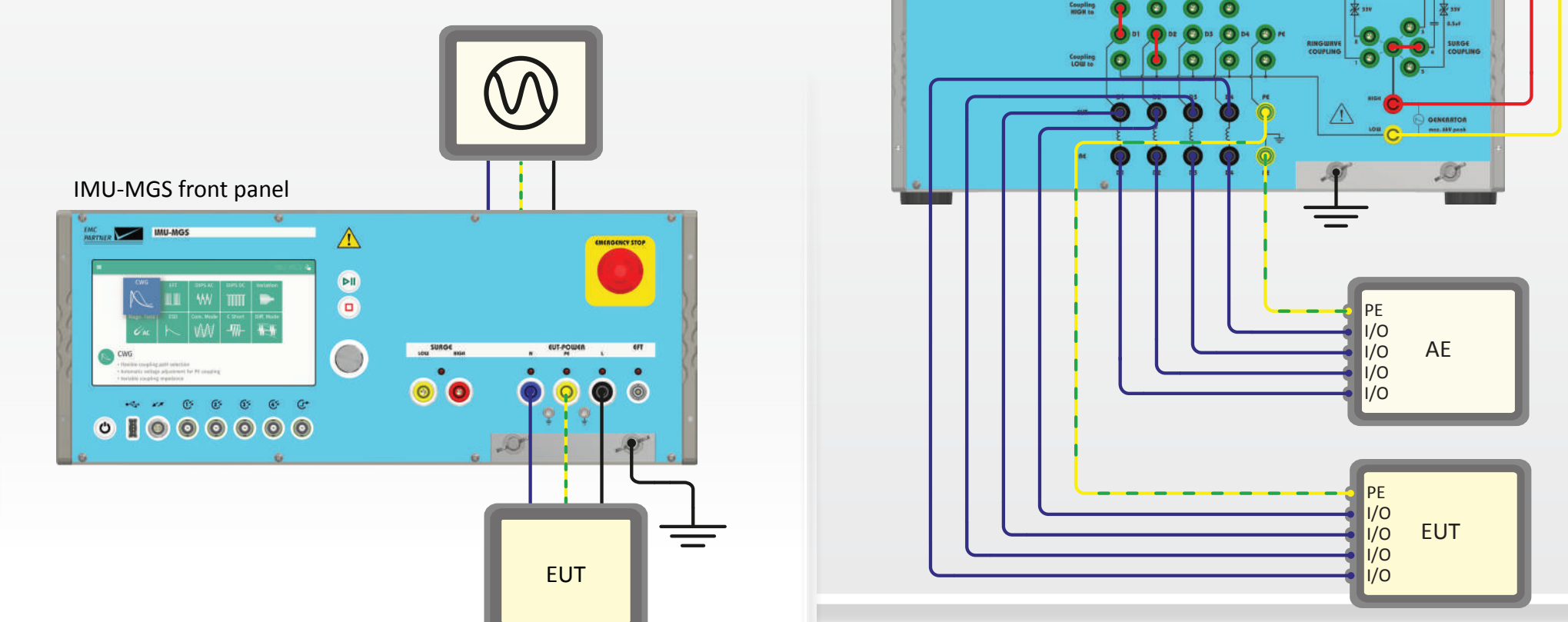
Calibration at output of the generator

Open circuit voltage Upeak [kV] ± 10%	Short circuit current Ipeak [kA] ± 10%
0.5	0.25
1	0.5
2	1
4	2



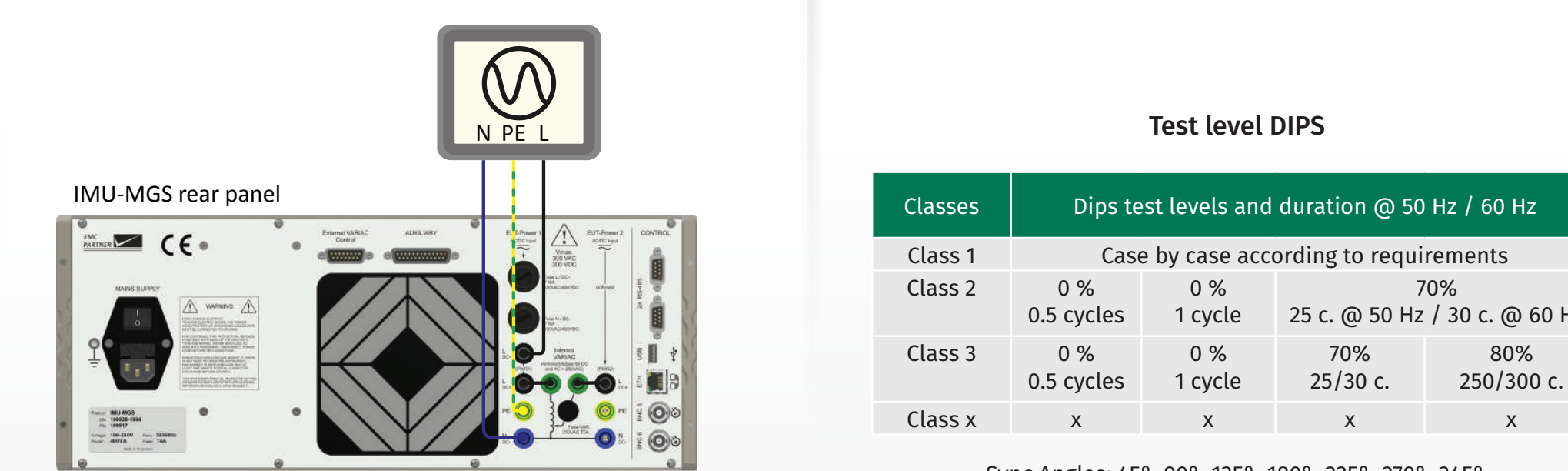
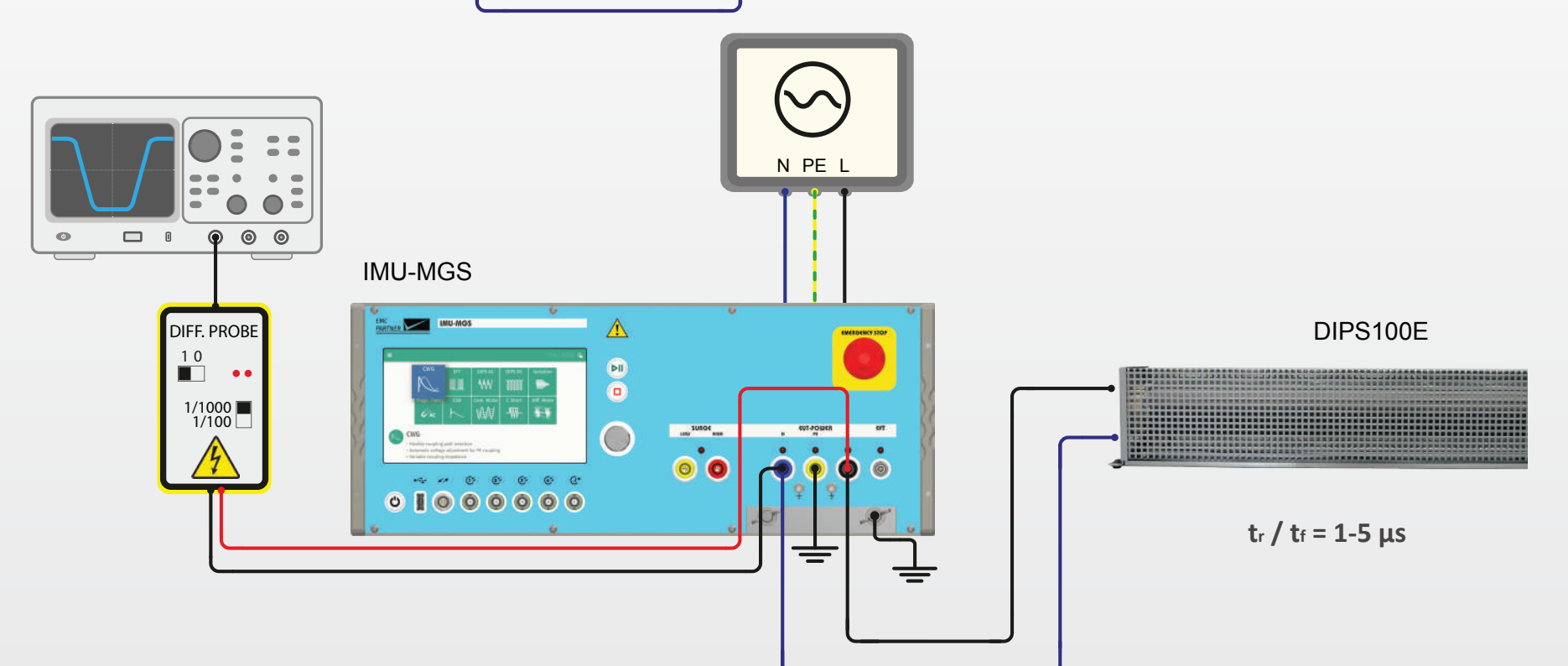
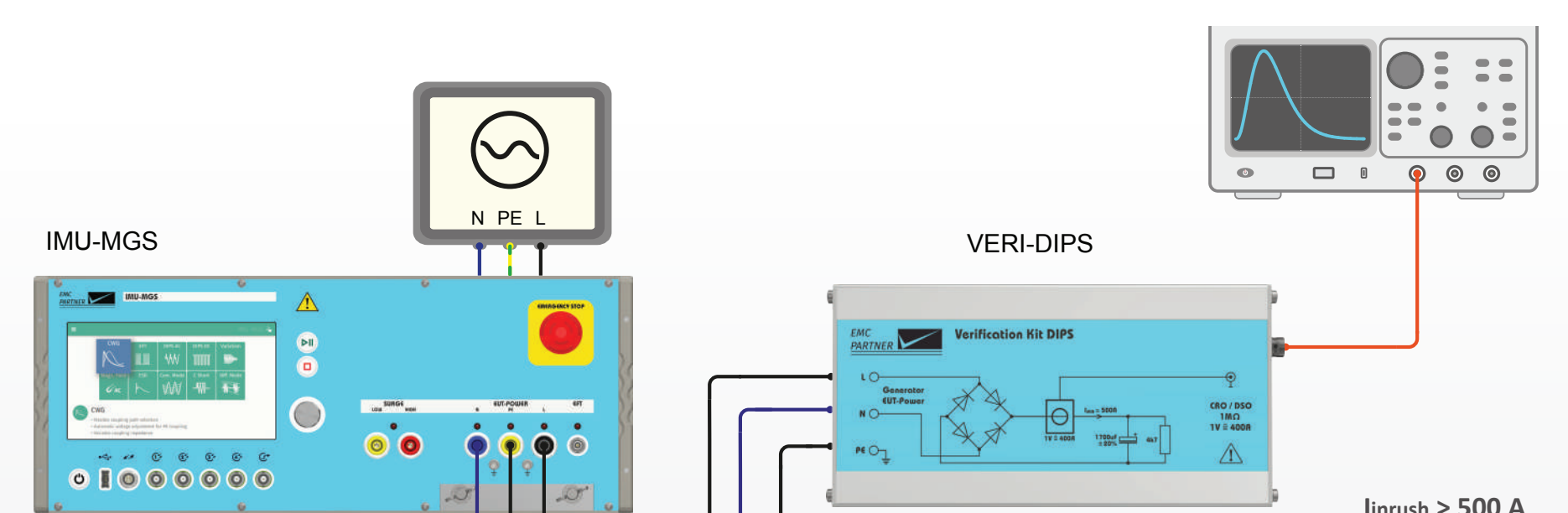
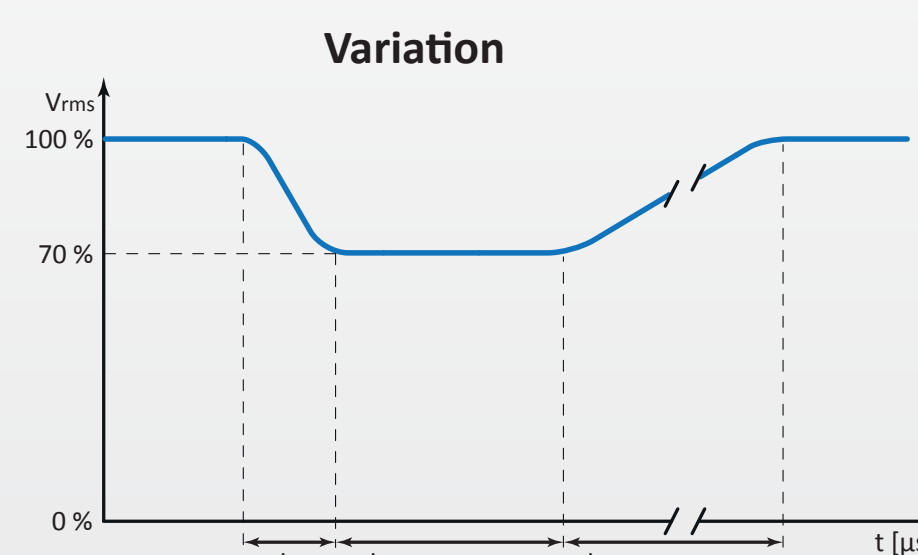
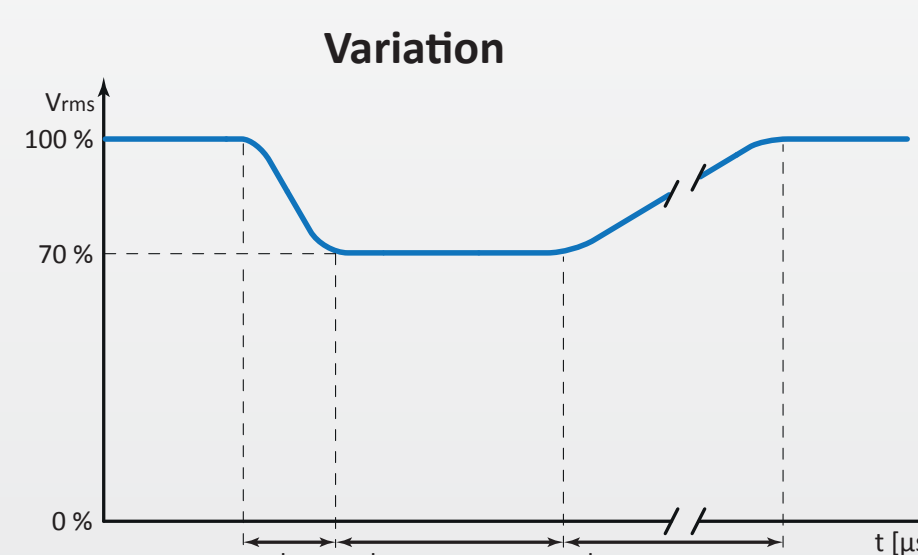
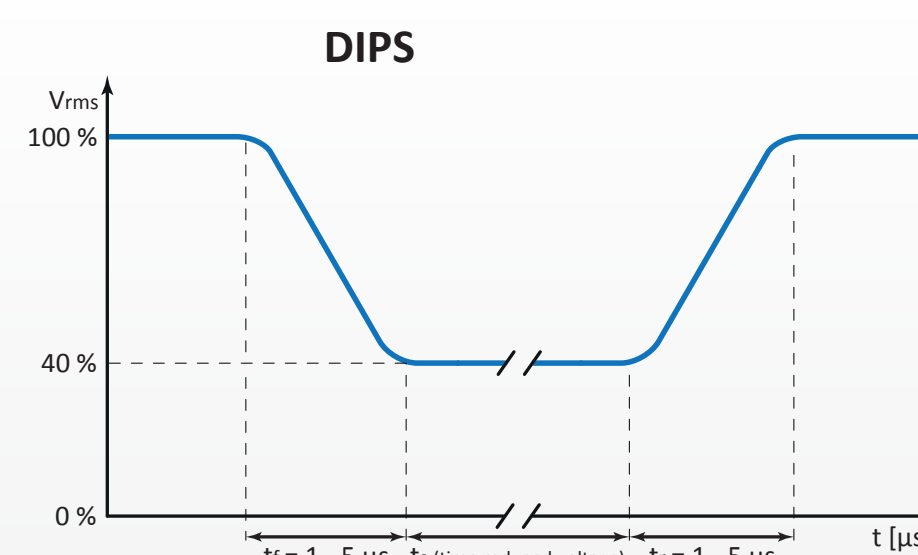
Test levels

Level	Line - Line		Line - Ground	
	Upeak [kV]	Ipeak [kV]	Upeak [kV]	Ipeak [kV]
1	-	-	0.5	-
2	0.5	1	1	-
3	1	2	2	-
4	2	4	4	-
X	special	special	special	special



DIPS INTERRUPTS VARIATIONS

IEC 61000-4-11



Test level Interruptions

Classes	Interruptions test levels and duration @ 50 Hz / 60 Hz
Class 1	Case by case according to requirements
Class 2	0% during 250/300 cycles
Class 3	0% during 250/300 cycles

Test level DIPS

Classes	Dips test levels and duration @ 50 Hz / 60 Hz			
Class 1	Case by case according to requirements	0%	70%	
Class 2	0.5 cycles	1 cycle	25 c. @ 50 Hz / 30 c. @ 60 Hz	80%
Class 3	0.5 cycles	1 cycle	25/30 c.	250/300 c.
Class x	x	x	x	x

Sym Angles: 45°, 90°, 135°, 180°, 225°, 270°, 345°
3 dips with an interruption of at least 10s

Test levels variations

Test level	Voltage decrease	Time @ reduced U	Time for increasing U
70%	abrupt	1 cycle	25/30 cycles
x	x	x	x

