

Nortelco Danmark

Kom godt i gang med ESD TEST

<http://www.nortelcoelectronics.dk/dk/EMC-test>

ESD testing according to EN 61000-4-2



Contact discharge:

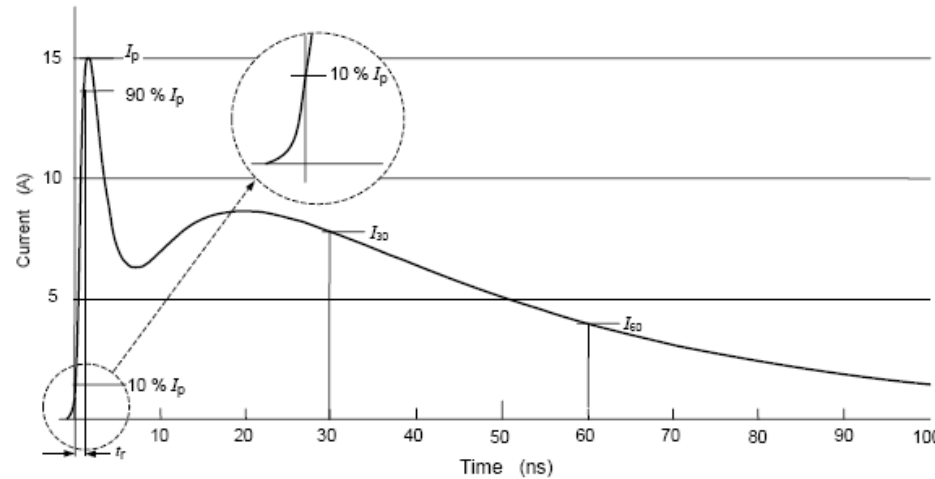


Table 3 – Contact discharge current waveform parameters

Level	Indicated voltage kV	First peak current of discharge $\pm 15\%$ A	Rise time t_r ($\pm 25\%$) ns	Current ($\pm 30\%$) at 30 ns A	Current ($\pm 30\%$) at 60 ns A
1	2	7,5	0,8	4	2
2	4	15	0,8	8	4
3	6	22,5	0,8	12	6
4	8	30	0,8	16	8

The reference point for measuring the time for the current at 30 ns and 60 ns is the instant when the current first reaches 10 % of the 1st peak of the discharge current.

NOTE The rise time, t_r , is the time interval between 10 % and 90 % value of 1st peak current.

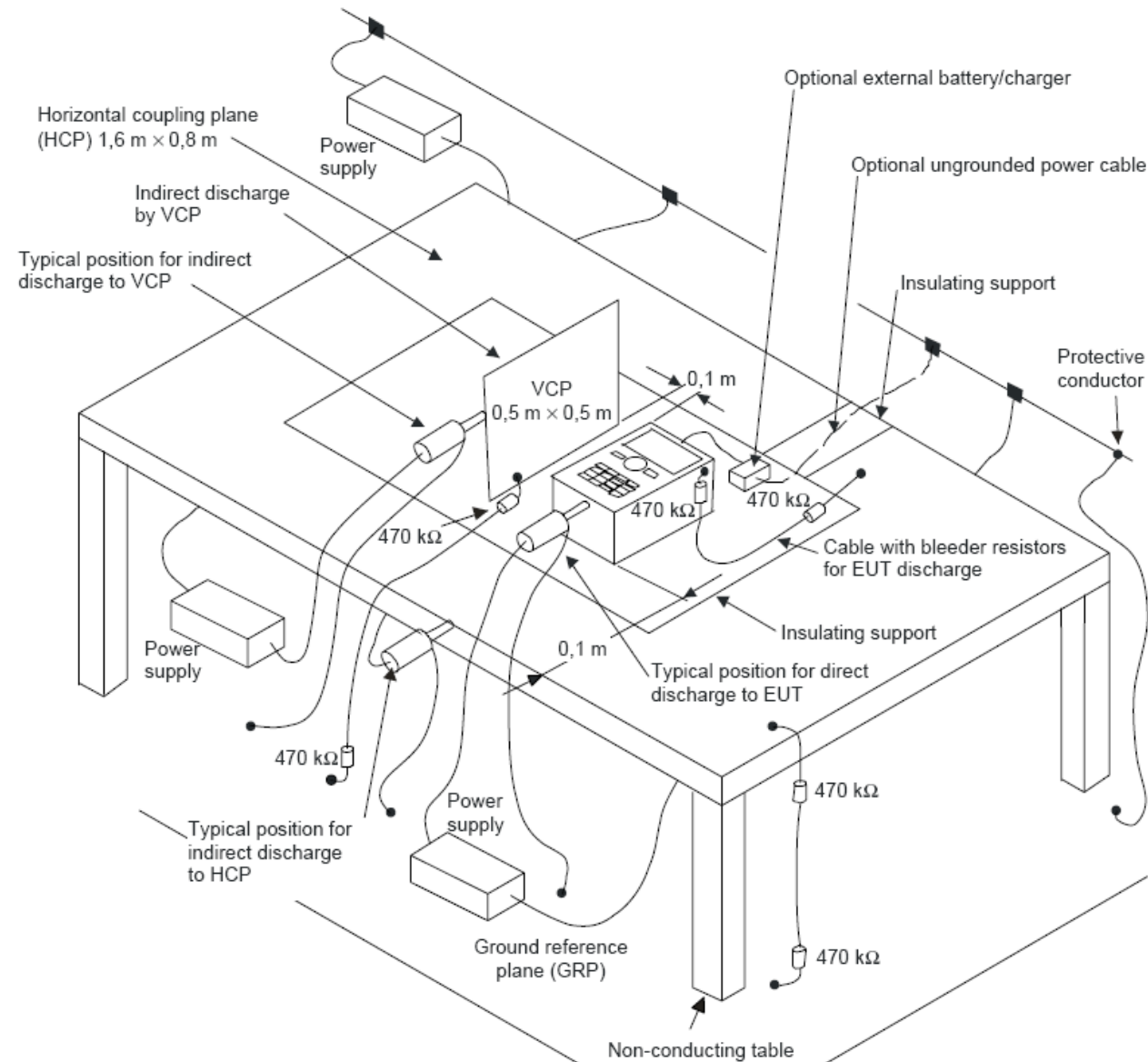
Severity levels



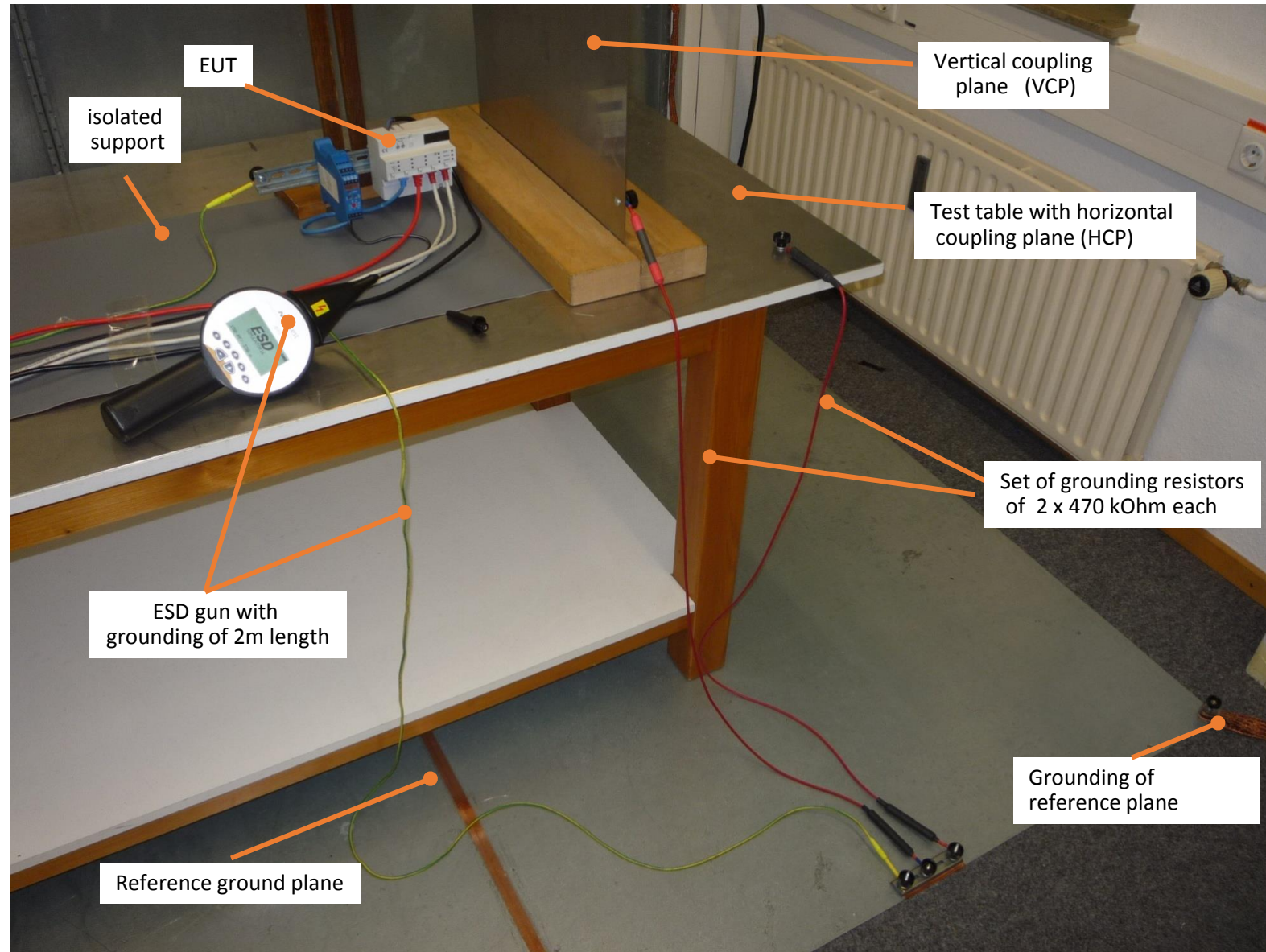
- For air discharge all test levels up to requirement have to be tested.
- For contact discharge only the specified test levels have to be tested (however, we recommend to continue testing as for air discharge).
- Maximum 1 discharge per second
- min. 10 discharges with stronger polarity

Level	Air discharge	Contact discharge
1	2 kV	2 kV
2	4 kV	4 kV
3	8 kV	6 kV
4	15 kV	8 kV

Test set-up for table top devices



Picture of real test set-up for ESD

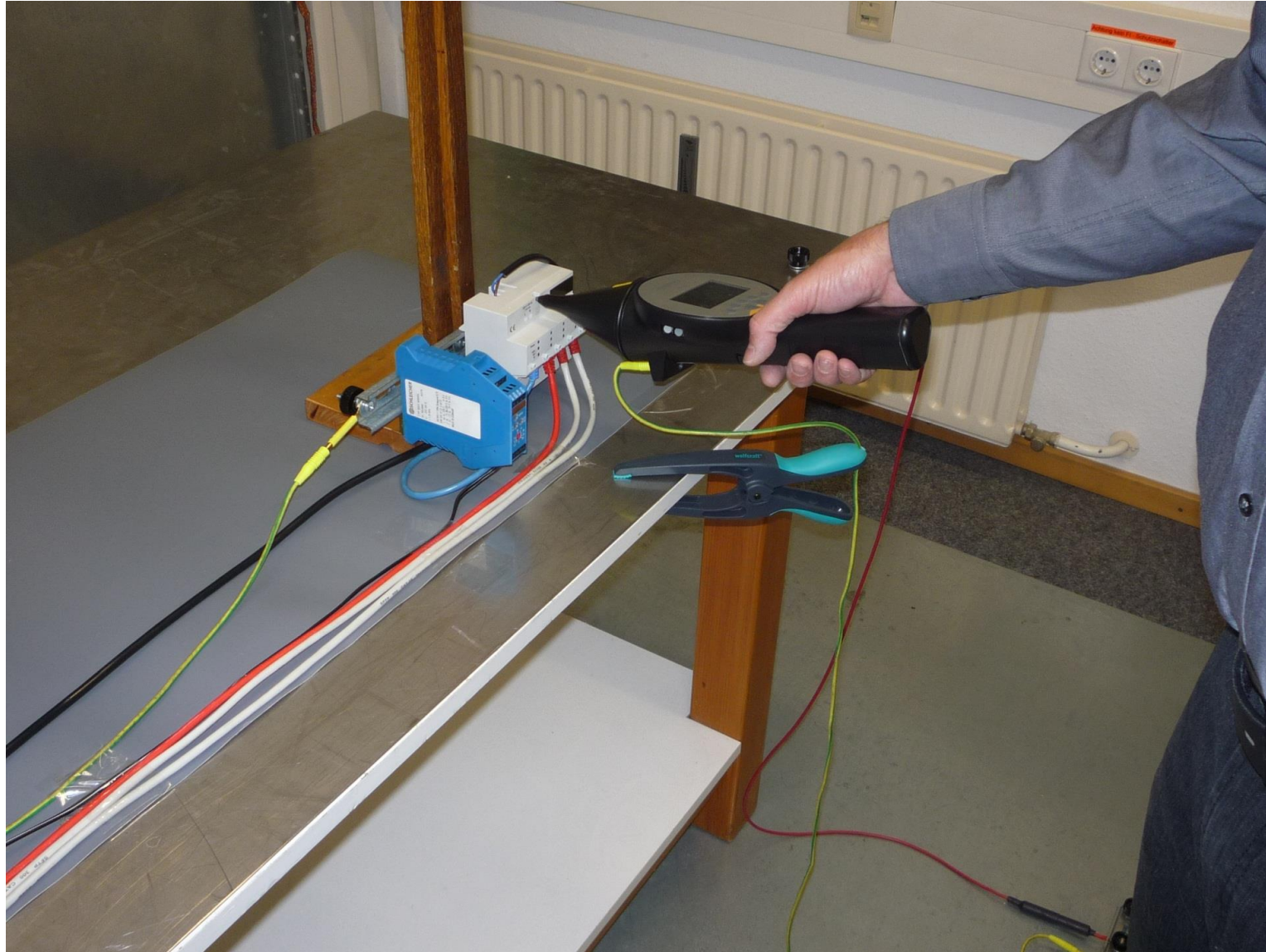


Test set-up description and test execution

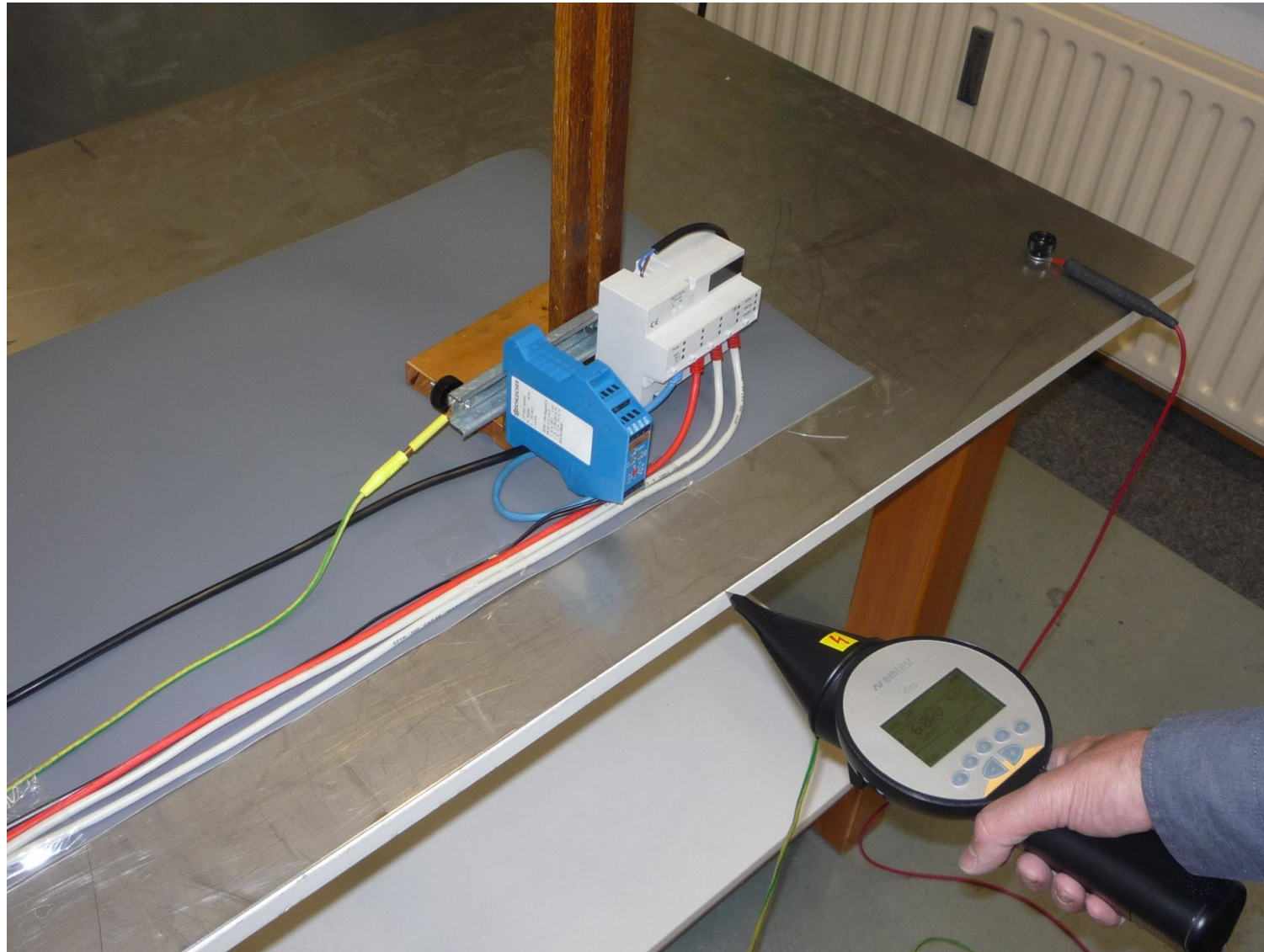


- The horizontal coupling plane (HCP) must have a size of $(1.6 \pm 0,2)\text{m} \times (0.8 \pm 0,2)\text{m}$.
- The HCP is 0.8m above the ground plane (GRP) on a non-metallic table and is connected via $2 \times 470 \text{ k}\Omega$ to the GRP.
- The ground plane (GRP) shall project beyond the EUT or the dimensions of the HCP by at least 0.5m and shall be connected to the protective grounding system.
- The HCP shall project beyond the EUT including connection lines by at least 10 cm to all sides.
- The EUT table has to provide a distance of $>0.8\text{m}$ to any other conducting structures.
- The EUT and cables shall be isolated from the coupling plane by an insulating support $0,5\text{mm} \pm 0,05\text{mm}$ thick.
- The grounding ratio of the EUT shall be according to the real ratio, i.e. if the EUT is additionally grounded in practice, then this has to be considered as well in the test set-up. Attention, but not at HCP!
- The return cable of the test gun or discharge circuit respectively has to be connected with the GRP and has to be leaded in a distance of $\geq 0.2\text{m}$ to the EUT and its lines while discharging.
- It is not allowed to hold the return cable in the hand.
- The test gun is kept in a 90° angle to the discharge point. If this is not possible, it has to be stated into the test report.

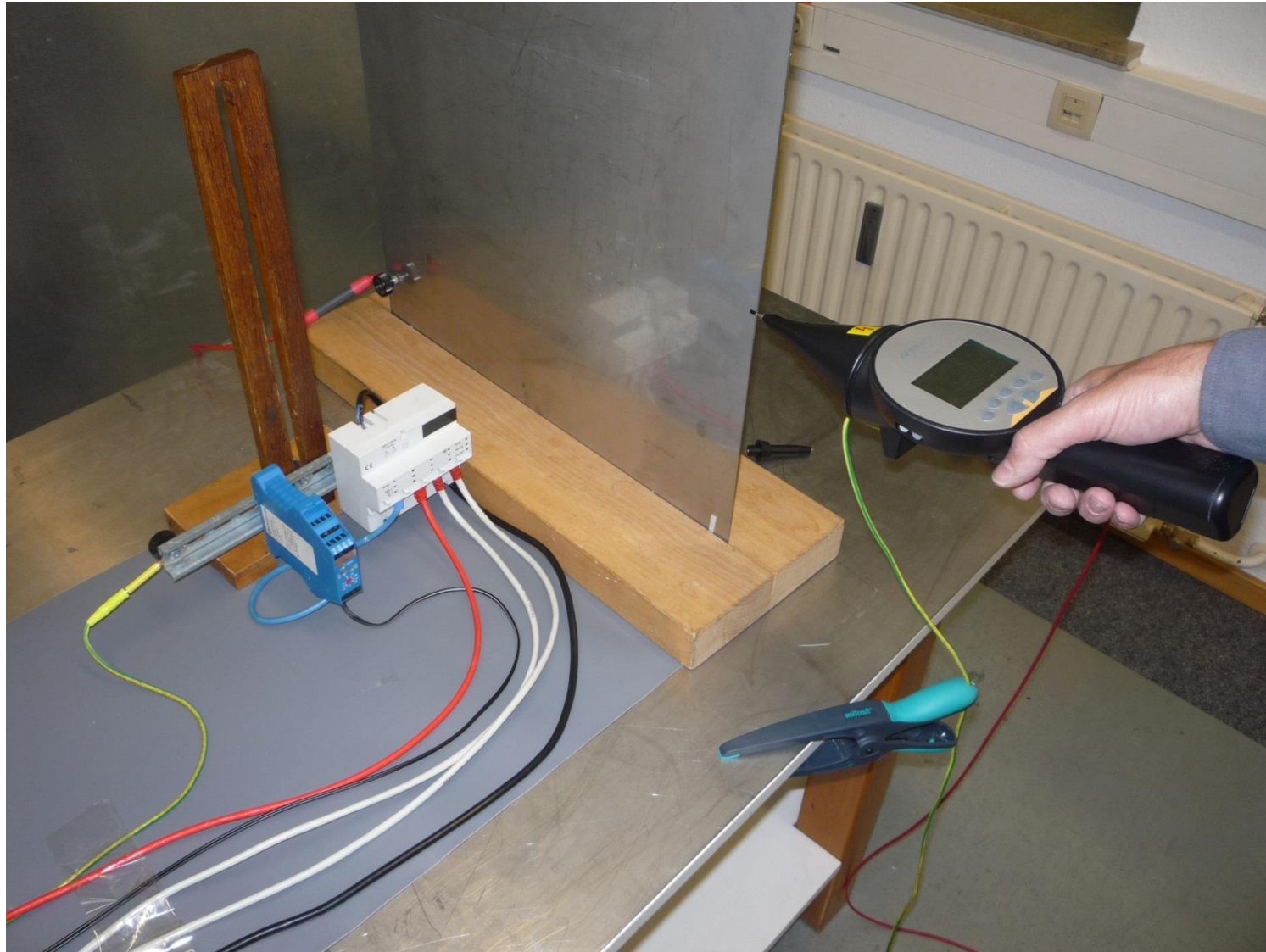
Direct discharge as contact discharge



Indirect discharge on HCP



Indirect discharge on VCP



Test points according to EN 61000-4-2



- **Direct discharge**

- All accessible points (touchable by user)
- Housing: edges, angles, surfaces, slots, indicator parts
- Operating parts: switches, buttons, plugs, etc.
- Interfaces with metallic housing: only contact discharge on plug housing
- Interfaces with isolated housing: only air discharge on plug housing
- In certain cases product standards can request the discharge on pins

- **Indirect discharge**

- Edge of vertical coupling plane, VCP with 10 cm distance to each EUT side
- Edge of horizontal coupling plane, EUT with each side with 10 cm distance to the discharge point

Indkøbsliste

- 16 KV ESD Simulator:
 - **DITO** Battery powered ESD simulator - **Pris** 43.200,00 DKK
- 30KV ESD Simulator:
 - **ESD 30N** ESD Simulator - **Pris** 71.100,00 DKK
- Solid **wooden table** according to IEC/EN 61000-4-X, ISO 11452-4:
 - **PRT/SPZ2** - **Pris** 9.000,00 DKK
 - Solid wooden table (pine) for EMC testing
 - dimensions: 2000 mm x 1000 mm x 800 mm (L x W x H)
 - ground plane (HCP): 2000 mm x 1000 mm x 1,5 mm (L x W x H)
- **VCP**, Vertical Coupling Plane incl. one set EAS30 - **Pris** 4.725,00 DKK
- EAS30 Grounding cable with 470kOhm at each end - **Pris** 2.175,00 DKK
- EAS30 Bleeder cable with 470kOhm at each end - **Pris** 2.175,00 DKK
- Insulating support (0,5 ±0,05)mm thick
- Reference ground plane (GRP): >2500 mm x >1500 mm x 1,5 mm (L x W x H)
- Copper/metal cables or bars for grounding, minimum 2 cm width and 1 mm thick. Length is individual

Note: Alle priser er i DKK og excl. moms

