



**EAC Decision on Request for Interpretation 2010-01**  
**2002 VSS Vol. I, Sections, 3.2.2.8**  
**2005 VVSG Vol. I, Sections, 4.1.2.8**

***Date:***

March 16, 2010

***Question(s):***

What voltage levels must be tested when performing the ESD test?

***Section of Standards or Guidelines:***

**2002 VSS Vol. I, Section 3.2.2.8 & Vol. 2, 4.8.3**  
**2005 VVSG Vol. I, Section 4.1.2.8 & Vol. 2, 4.8c**

**VSS Volume I Section 3.2.2.8 Electrostatic Disruption**

Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand  $\pm 15$  kV air discharge and  $\pm 8$  kV contact discharge without damage or loss of data. The equipment may reset or have momentary interruption so long as normal operation is resumed without human intervention or loss of data. Loss of data means votes that have been completed and confirmed to the voter.

**VSS Volume II Section 4.8.3 Electrostatic Disruption**

The test for electrostatic disruption shall be conducted in compliance with the test specified in IEC 61000-4-2 (1995-01).

**VVSG Volume I Section 4.1.2.8 Electrostatic Disruption**

Vote scanning and counting equipment for paper-based systems, and all DRE equipment, shall be able to withstand  $\pm 15$  kV air discharge and  $\pm 8$  kV contact discharge without damage or loss of data. The equipment may reset or have momentary interruption so long as normal operation is resumed without human intervention or loss of data. Loss of data means votes that have been completed and confirmed to the voter.

**VVSG Volume II Section 4.8c Electrostatic Disruption**

The test for electrostatic disruption shall be conducted in compliance with the test specified in IEC 61000-4-2 (1995-01).

**Background:**

The following is quoted from IEC 61000-4-2, Edition 2.0 2008-12:

*The preferred range of test levels for the ESD test is given in Table 1.*

*Contact discharge is the preferred test method. Air discharges shall be used where contact discharge cannot be applied. Voltages for each test method are given in Table 1.*

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*For air discharge testing, the test shall be applied at all test levels in Table 1 up to and including the specified test level. For contact discharge testing, the test shall be applied at the specified test level only unless otherwise specified by product committees.*

**Table 1 – Test levels**

Contact discharge		Air discharge	
Level	Test voltage kV	Level	Test voltage kV
1	2	1	2
2	4	2	4
3	6	3	8
4	8	4	15
x <sup>a</sup>	Special	x <sup>a</sup>	Special

<sup>a</sup> "x" can be any level, above, below or in between the others. The level shall be specified in the dedicated equipment specification. If higher voltages than those shown are specified, special test equipment may be needed.

**Conclusion:**

The test levels stated in IEC 61000-4-2, Edition 2.0, contact discharge, are the test method and shall be applied at the specified test level only, 8 kV. Air discharge shall be used where contact discharge cannot be applied and all test levels shall be used (2, 4, 8, 15 kV).

Voting systems are required to be immune to ESD up to the limits of 8 KV, contact discharge, and 15 KV, air discharge. During exploratory pre-testing investigation of the possibility of windowing effects should be explored. If there are indications that a units has sensitivity at a lower voltage but not at a higher voltage test levels shall be added to evaluate the immunity at lower voltage levels.

**Effective Date:**

For all systems without an approved test plan.