

# **Technical Report**

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***Extractor system, measurement of the conductivity in accordance with IEC61340-5-1.***

***Client: Alsident system A/S***

Project no.: E400529

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**Title** Extractor system, measurement of the conductivity in accordance with IEC61340-5-1.

**System description** Conductive extractor system to be used in an Electro static protected area.

**Project no.** E400529

**Date of investigation** 2003-03-11

**Client** Alsident System A/S  
Finlandsvej 10  
DK-8450 Hammel

**Test ordered by** Lars Vester Rasmussen

**Investigation carried out at** System 50  
System 75  
System 100

**Date** 2003-03-14

**Test engineer and project leader** Per Bo Sondrup

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## **1. Conclusion**

The tested System 50, System 75 and System 100 comply with the requirements for “Surface resistance” and “Resistance to ground able point” as specified in IEC 61340-5-1 Protection of electronic devices from electrostatic phenomena – General requirements.

The system 50, System 75 and System 100 hereby comply with the requirements specified for items used in an ESD protected area.

## 2. *Introduction*

The extractor System 50, System 75 and System 100, consist of separate items which can be connected together and when connected together performing as a extractor system.

The difference between the trees systems are the diameter of the tubes.

System 50 tube diameter: 50mm Alu.

System 75 tube diameter: 75mm Plastic

System 100 tube diameter: 100mm Plastic

### 3. **Requirements**

The relevant requirements for the conductivity properties for the extractor system are specified in the technical report:

IEC61340-5-1. Protection of electronic devices from electrostatic phenomena – General requirements.

Table 1 “ESD protective item requirements“ describe the requirements for different items.

DELTA categorizes the extractor system as “Tools”.

For “tools” there are specified two sets of requirements of interest for the extractor system:

Surface resistance

Resistance to EPA ground or ground able point.

#### **Requirements for surface resistance:**

For tools note 4 is relevant.

Note 4 give a reference to IEC61340-5-2

IEC61340-5-2:

*5.2.10 Tools, machinery, dispensers and test equipment*

*All tools and machinery, for example electrical, mechanical or pneumatic, shall be so constructed that any non-insulating part of the tool or machine which may touch an ESDS shall be at EPA ground potential.*

The resistance to ground is specified to less than  $1 \times 10^{12}$ .

No requirements are specified for surface resistance, therefore DELTA use the specification for “Working surfaces, storage racks, trolleys and carts”, when measuring the separate items.

Specifications for working surfaces, storage racks, trolleys:

Surface resistance  $< 1 \times 10^{10}$

#### **Resistance to EPA ground or ground able point.**

Resistance to ground  $< 1 \times 10^{12}$ ohm.

(There is no minimum value of resistance for protection of electro static sensitive devices).

#### **4. *Measurement of conductivity***

The measurements were performed in accordance with IEC61340-5-1

The measurements of surface resistance were performed at each separate item.

Each item can consist of more than one piece. In this situation each piece is measured.  
The connections between the pieces are also measured.

Following, when the separate items are connected together in a system the resistances to ground able point were measured.

The measurements were performed with a test voltage at 100V.

The results are listed in the table:

<b>Temperature: 21.8 degrees Celsius</b> <b>Relative humidity: 36.9%</b>		<b>Surface resistance</b> < 1 x 10E10 Ohm		
<b>Accessories Name</b>	<b>The names in Danish languages</b>	<b>System 50</b>	<b>System 75</b>	<b>System 100</b>
Suction Nozzle	Sugespalte	5 pieces OK		
Extractor tube	Sugespids alu 210mm	230mm alu. OK		
Extractor tube	Sugespids alu 310mm	alu OK		
Extractor tube	Sugespids sort 250mm		2 pieces plastic OK	
Extractor tube	Sugespids sort næse	2 pieces 230mm plastic/alu OK		
Extractor tube	Sugespids sort næse	2 pieces 330mm plastic/alu OK		
Hood 200mm	Skærm HR200mm	4 pieces alu 205 OK	4 pieces plastic/alu 205 OK	2 pieces plastic/alu OK
Hood 350mm metal	Metal skærm Ø350mm			4 pieces OK
Hood 385mm black	Sort skærm Ø385mm	4 pieces plastic/ alu OK	4 pieces plastic OK	4 pieces plastic OK
Hood 500mm black	Sort skærm Ø500mm			4 pieces plastic OK
Flat hood small	Fladskærm, lille	4 pieces 320x240 plastic/alu OK	4 pieces 320x240 plastic OK	
Flat hood large	Fladskærm stor			4 pieces 410x270 plastic OK
		<b>Resistance to ground able point</b> < 1 x 10E12 Ohm		
The items connected together	Emnerne forbunden med hinanden	Short OK Long OK	Short OK Long OK	Short OK Long OK

## 5. *Measurement directly on the O-ring*

<b>Test voltage</b>	<b>O-ring</b>
100V	5V/780uA
100V	-
100V	-
500V	-
500V	-
500V	-

### 5.1 *Conclusion*

The O-ring is very conductive.

## **6. *Test equipment***

### **Power supply**

Type: 3655

Manufacture: SF

### **Measurement of voltage**

Multimeter

Type 79

Manufacture: Fluke

### **Measurement of current**

Multimeter

Type 8060A

Manufacture: Fluke

***Annex 1***

***Photo of test setups***



***Photo no. 1: Measurements equipment***