

# EDA III System

*Evaluation test for  
Electrical Rotary Machines*



# EDA III System

## WHAT IS THE EDA SYSTEM?

The EDA system is ideal for the evaluation and diagnosis of the insulation condition in electrical rotary machines such as motors, generators, alternators, etc. Its main function is to analyse the condition of the stator winding insulation, using DC voltage levels without risk to the element under test.

The system obtains various parameters to evaluate the state of each of the components that make up the insulation in a rotary machine. Using these values and changes over time, it is possible to make a reliable diagnosis of the overall condition or specific problems, such as dirtiness, internal or external humidity, insulation degradation, partial discharges, etc.

The system has been developed using the experiences of users, resulting in a completely automated system with optimized measuring features.

## ADVANTAGES

The EDA system is completely automatic with a data management system. This guarantees consistent testing results without operator influence when performing the test. The system uses test voltage levels lower than the nominal operating voltage of the element being tested, thereby assuring that the insulation will not be damaged while testing. Data such as temperature, voltage level, capacitance, and insulation thickness, is standardised and automatically stored.

When a test is completed, data is also stored in an organized way. This allows a report to be directly printed. Graphs of the charging and discharging cycles of the machine are produced, by which it is possible to identify many problems.

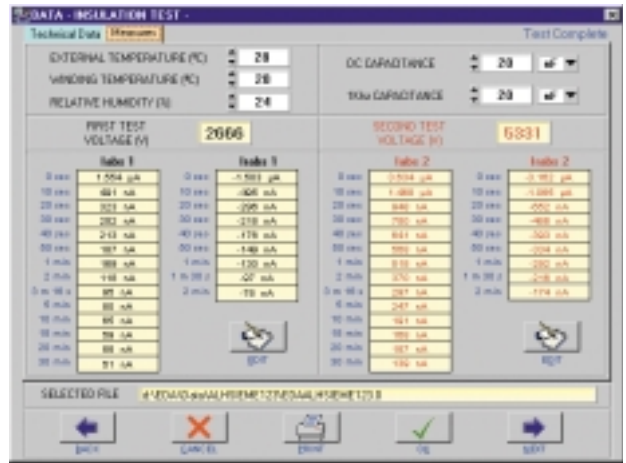
## INFORMATION OBTAINED

Results of the tests made by the system are presented 2 ways, Numerically and Graphically. The numeric information is presented by means of parameters list, automatically calculated with the corresponding corrections. The graphic information is presented with the charge and discharge current curves for each test voltage and a polarization index curve. The polarization curve may be optionally smoothed to remove unwanted transient external effects from the real measurement.

### a) Numeric Information

- Actual test voltage.
- External temperature
- External humidity
- DC and 1 kHz Capacitance
- Ratio of DC and 1 kHz capacitances
- Test Voltage Ratio

For each test voltage, the EDA system carries out a charge and discharge cycle from which we get the following information:



Charge / discharge current values

- Insulation resistance (corrected to 20° and 40°C)
- Polarization index
- Absorption index
- Leakage current
- Standardised leakage intensity (voltage and capacitance)
- Leakage current ratio at each test voltage



List of calculated parameters

- Absorption ratio
- Leakage/Re-absorption current ratio
- Re-absorption current
- Re-absorption current standardised for insulation thickness
- Time constant

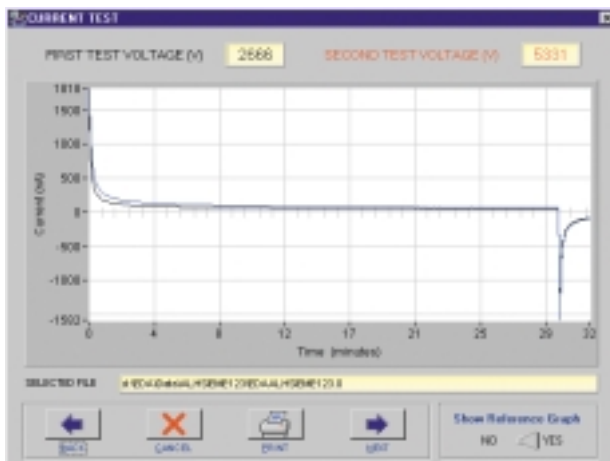
The data information is associated with the test voltage, indicating the results for each test.

Information is provided with each parameter to determine the state of the parts which makes up the insulation of the electrical rotary machine.

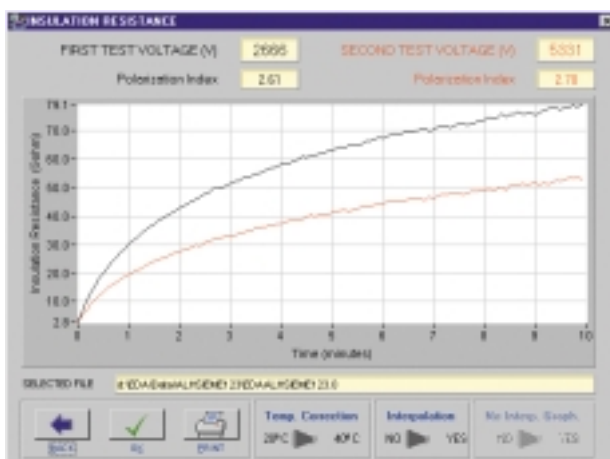
### b) Graphic Information

Also provided is a graphic display of the charge and discharge currents for each test voltage. Additionally a "standard" curve is displayed to easily determine departures from the linear insulation behaviour versus the voltage increase.

A curve is displayed during the polarisation index test. Curves may be optionally smoothed to remove unwanted transient external effects from the real measurements.



Charge / discharge curves



Smoothed polarization index curve

## APPLICATIONS

For initial reception and quality control of rotary machines (generators, alternators, LV and MV motors).

Forming a part of a maintenance program on rotary machines, where a non-programmed failure would represent a high costs, risks and installation outage, and of course, to verify failures.

To create a historial of the motors, etc. tested as the EDA system generates a report. In this report all technical data of previous tests are presented in a structured manner to easy follow the history of the element tested.

To evaluate the parameters tested, anticipating failures and to diagnose the type of problem, thus planning in advance, the necessary maintenance steps required.

## TECHNICAL SPECIFICATION

The system is formed by:  
A EDAll measuring / Switching unit, software, and the test cable set.  
A Computer is required with the following minimum requirements  
Pentium 200 MHz, 16 Mb of RAM, 2Gb HD and RS232 output.

EDAll Measuring / switching unit

### Output signal

Voltage 0...6000 V d.c.  
Short-circuit current: 0...5 mA

### Voltage measurement

Voltage 0...6000 V. accuracy  $\pm 2\%$  with a LED indicator on the front panel

### Current measurement

Current Auto-range (3 scales 0 to 5.12 mA)  
Resolution 1 nA.  
accuracy  $\pm 1\%$

### Capacitance measurement

d.c. capacitance 10 nF to 10 mF  $\pm 5\%$   
a.c. capacitance 10 nF to 10 mF  $\pm 5\%$

### Environmental measurement

Humidity 10% at 90%. Accuracy  $\pm 10\%$   
Temperature  $-10^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ . Accuracy  $\pm 2\%$

### Others

Operational temperature  $10^{\circ}\text{C}$  to  $50^{\circ}\text{C}$   
Operational Humidity 10% to 75%

### Dimension

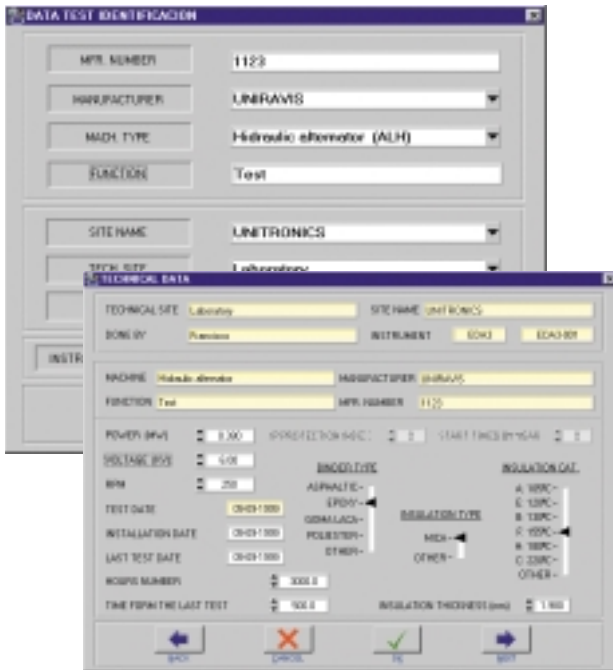
Rack format 19" x 3U  
Weight 9 Kg

### Cables

2x5 m. high voltage cables with clips (Standard)  
2 x 20 m. high voltage cables with clips (Optional)

# EDA III SOFTWARE

## TEST IDENTIFICATION



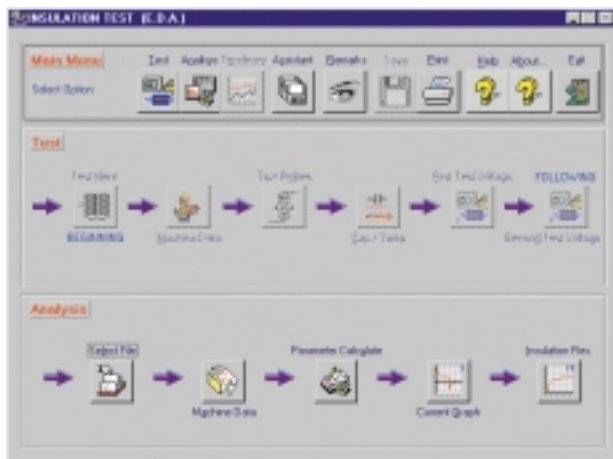
Each test is identified by three fields:

The manufacturer, manufacturer's serial number, and type of electrical rotary machine.

This fixed data is stored, together with other technical data for the machine. This data will be valid the next time tests are made on the same element.

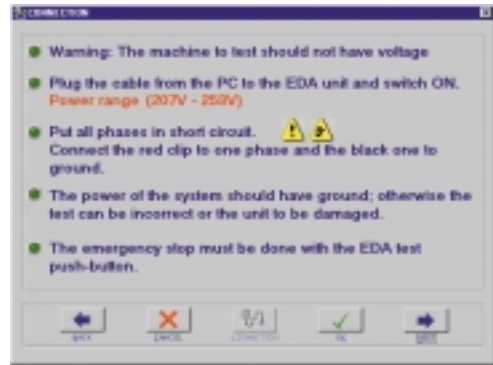
## MAIN MENU SCREEN

The software program displays the logic step sequence to follow when we make a measurement or during the analysis process. Icons show each of the steps which are preceded by an arrow that blinks to indicate which is the following process. Icons are only enabled when the previous tests have been completed. This procedure is used to guarantee repeatable tests, without leaving out essential steps and to provide data for later analysis.

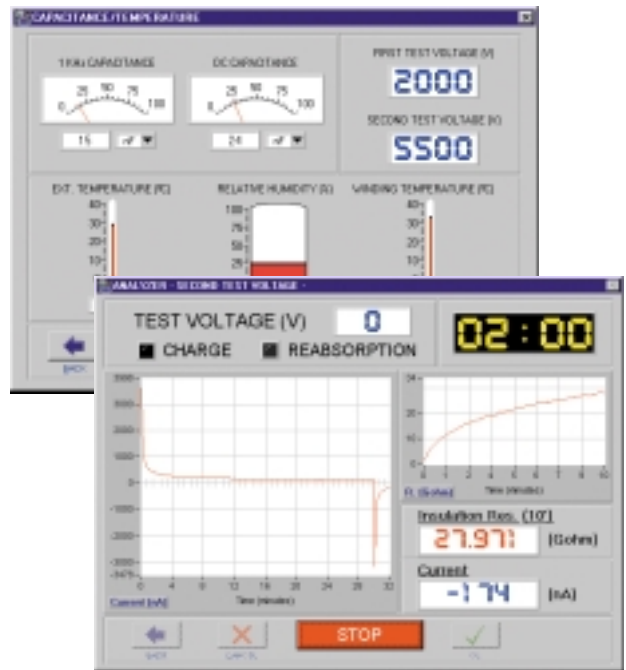


## ON SCREEN GUIDES

The software constantly informs the operator about the connections required, precautions that must be taken, and status of the test (measuring, calibrating, record updating, printing, etc). It is very interactive with the operator.



## CHARGE / DISCHARGE CYCLE MEASUREMENT



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