



www.edibon.com
 PRODUCTS
 40.- ELECTRICITY

INTRODUCTION

The transformers are devices designed to adapt the electrical energy, voltage or current, to the properly conditions for its usage. Besides, the transformers are present in multitude of industrial processes suitable both for current and voltage meters to power adapters. These machines are subjected to enormous thermal and mechanical stresses, so a fault can diminish considerably its service life.



ISO 9001: Quality Management (for Design, Manufacturing, Commercialization and After-sales service)



European Union Certificate (total safety)



Certificates ISO 14001 and ECO-Management and Audit Scheme (environmental management)



Certificate and Worlddidac Member

GENERAL DESCRIPTION

The Fault Simulation Trainer in Transformers "AEL-ESAT" has been designed by Edibon to simulate non-destructive faults in three-phase transformers and application of diagnostic and localization techniques.

This trainer allows simulating different breakdowns that can usually take place in in three-phase transformers, such as: Phase loss detection, power supply loss detection, short-circuited turn-coil detection, open coil detection, short-circuit between different phase coils detection and ground derivation detection.

All this simulations are carried out by the AEL-ESAT trainer, which has a circuit control that realizes the failures randomly.

The AEL-ESAT includes the following modules:

- N-ALI01. Industrial Main Power Supply.
- N-FTAC. Fault Injection module for three-phase transformers.
- N-MED65. Digital Multimeter.
- Three-Phase transformer for faults simulation.

Expansion learning software:

In addition, Edibon provides expansion learning software (AEL-ESAT/ICAL) to reinforce knowledge about this field.

This software is formed by:

- ECM-SOF. EDIBON Classroom Manager (Instructor Software).
- ESL-SOF. EDIBON Student Labsoft (Student Software).

The application AEL-ESAT can be mounted on rack (option A) or on rail (option B):

Option A:

This application needs the following rack.

- N-RACK-M.

Optionally the AEL-WBR. Electrical Workbench (Rack) can be supplied to place the rack/s.

Option B:

This trainer can be mounted on rail.

Optionally the AEL-WBC. Electrical Workbench (Rail) can be supplied to mount the modules.

SPECIFICATIONS

The trainer includes the following modules:

- **N-ALI01. Industrial Main Power Supply.**

Supply voltage: 400 VAC, 3PH+N+G.

ON-OFF removable key.

Output voltage connections:

Three-Phase + Neutral: 400 VAC.

Single-Phase: 230 VAC.

Three-Phase supply hose with IP44 3 PN+E 32A 400 V connecting plug.

Differential magnetothermal, 4 poles, 25 A, 300 mA AC 6 KA.



N-ALI01

- **N-MED65. Digital Multimeter.**

This module has a digital multimeter of about 3 ½ digits, with double-jack ending cables of about 4 mm to facilitate interconnections.

With this digital multimeter we will be able to measure:

Voltage.

Current.

Resistance.

Capacitors capacity.

Temperature.



N-MED65

- **N-FTAC. Fault Injection module for three-phase transformers.**

Lights:

To indicate that the unit is plugged in.

To indicate right feed on the specific terminal for phase R, S and T.

Input terminals:

For phases R, S, T and Neutral (N).

Of the transformer U1, V1 and W1.

Terminals for the transformer connection (star/delta).

ON/OFF switch of the unit.

Three-phase Power Supply Cable.

Automatic differential switch.

New practice sequence confirmation push-button:

Change from one breakdown sequence to another.

Transformer connection Wires.

Practice sequence and Practice Selector

6 positions to apply a breakdown sequence.

Transformer Breakdown Activation/Deactivation Switch.

Fuses: 6 x 2 A.



N-FTAC

- **Transformer for faults simulation.**

Nominal supply voltage: 400 and 230 VAC (3PH).

Nominal output voltage: 400 and 230 VAC (3PH).

Nominal power: 1 kVA.

- **All necessary cables to realize the practical exercises are included.**

Cables and Accessories, for normal operation.

Manuals:

This unit is **supplied with the following manuals**: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

EXERCISES AND PRACTICAL POSSIBILITIES

- | | |
|---|---|
| 1.- Detection of fault on a phase. | 6.- Detection of short circuit in coils from different phase. |
| 2.- Detection of fault on the supply voltage. | 7.- Measurement the resistance between coils from different phases. |
| 3.- Coils with turns in short circuit. | 8.- Detection of ground fault. |
| 4.- Measurement the resistance of the windings. | 9.- Measurement of the insulation resistance. |
| 5.- Detection of open-ended coil. | |

REQUIRED SERVICES

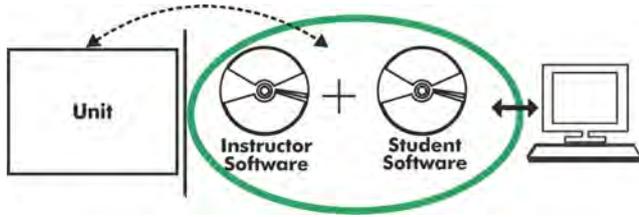
- | |
|--|
| - Electrical supply: three-phase, 380V/50 Hz or 208V/60 Hz, 20 Kw. |
|--|

DIMENSIONS AND WEIGHTS

- | |
|---|
| AEL-ESAT: |
| -Dimensions: 640 x 320 x 670 mm approx.
(25.19 x 12.59 x 26.37 inches approx.) |
| -Weight: 50 Kg approx.
(110 pounds approx.) |

Optional

AEL-ESAT/ICAI. Interactive Computer Aided Instruction Software System:



With no physical connection between unit and computer (PC), this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF). Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students.

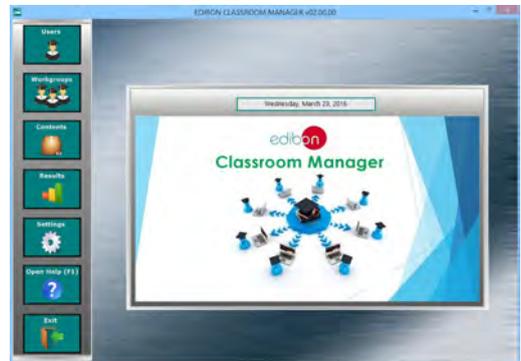
Instructor Software

- ECM-SOF. EDIBON Classroom Manager (Instructor Software).

ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual students, workgroups, units, etc... so the teacher can know in real time the level of understanding of any student in the classroom.

Innovative features:

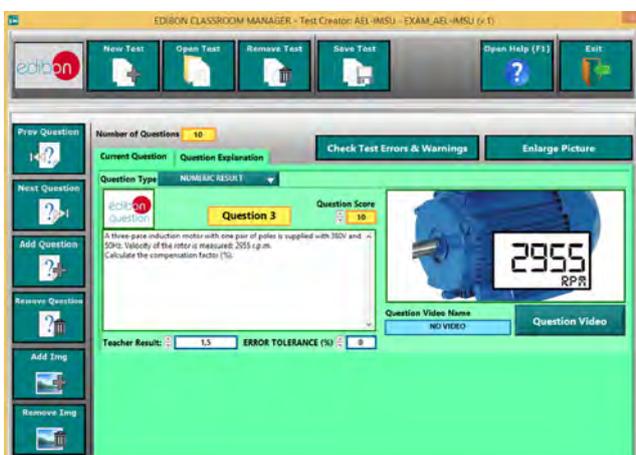
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.
- Updatable Contents.
- Report generation, User Progression Monitoring and Statistics.



ECM-SOF. EDIBON Classroom Manager (Instructor Software) Application Main Screen



ECAL. EDIBON Calculations Program Package - Formula Editor Screen



ETTE. EDIBON Training Test & Exam Program Package - Main Screen with Numeric Result Question



ERS. EDIBON Results & Statistics Program Package - Student Scores Histogram

Optional
Student Software

- ESL-SOF. **EDIBON Student Labsoft (Student Software)**.

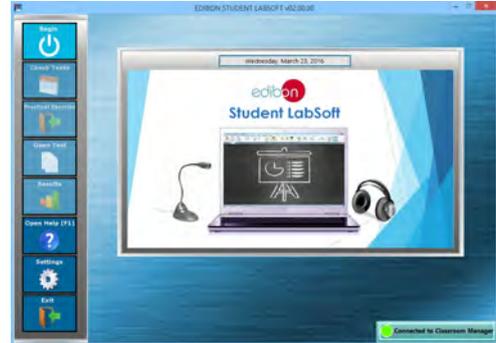
ESL-SOF is the application addressed to the Students that helps them to understand theoretical concepts by means of practical exercises and to prove their knowledge and progression by performing tests and calculations in addition to Multimedia Resources. Default planned tasks and an Open workgroup are provided by EDIBON to allow the students start working from the first session. Reports and statistics are available to know their progression at any time, as well as explanations for every exercise to reinforce the theoretically acquired technical knowledge.

Innovative features:

- **Student Log-In & Self-Registration.**
- **Existing Tasks checking & Monitoring.**
- **Default contents & scheduled tasks available to be used from the first session.**
- **Practical Exercises accomplishment by following the Manual provided by EDIBON.**
- **Evaluation Methods to prove your knowledge and progression.**
- **Test self-correction.**
- **Calculations computing and plotting.**
- **Equation System Solver Engine.**
- **User Monitoring Learning & Printable Reports.**
- **Multimedia-Supported auxiliary resources.**

For more information see **ICAI** catalogue. Click on the following link:

www.edibon.com/en/files/expansion/ICAI/catalog



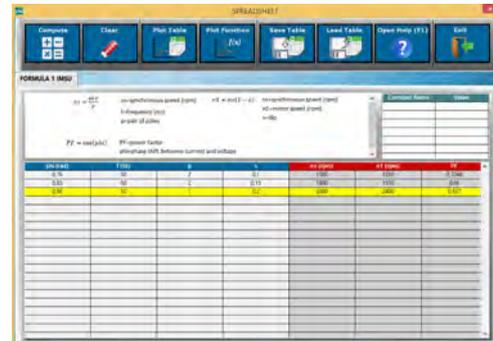
ESL-SOF. EDIBON Student LabSoft (Student Software)
Application Main Screen



EPE. EDIBON Practical Exercise Program Package Main Screen



ERS. EDIBON Results & Statistics Program Package - Question Explanation



ECAL. EDIBON Calculations Program Package Main Screen

* Specifications subject to change without previous notice, due to the convenience of improvement of the product.



C/ Del Agua, 14. Polígono Industrial San José de Valderas.
28918 LEGANÉS. (Madrid). ESPAÑA - SPAIN.
Tel: 34-91-6199363 Fax: 34-91-6198647
E-mail: edibon@edibon.com Web: www.edibon.com

Edition: ED01/17
Date: September/2017

REPRESENTATIVE:

