edibon

Engineering and Technical Teaching Equipment

AEL-AE5
RELAY CONTROL STATION
Estación de Control de Relés

INTRODUCTION

In an electrical installation, the fundamental rules are, the quality, the continuity and the security both system and users. To get these rules, it is used, among other things, the protection relays. Some of these kinds of relays are also used in individual equipment, such as electric motors or transformers. These relays can be adjusted to detect a determined level of current; the relays open the circuit to avoid damages in the installation, or in case of leakages, the damage to the people. Therefore, the protection relays are a very important part of the any electrical system.

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

The Protection Relays Control Application, "AEL-AE5", is designed with the aim to understand the working of protection relays. This application is formed by the next kind of relays: over current relays, which open the circuit when it detects a high level of current previously configured, and the leakage grounding relay, is capable to detect possible leakages to ground. To measure the currents, it is included current protection transformers, and to control the system, a three-pole contactor. Thus, the student can understand the working of the protection relays and simulate some scenes, such as, leakage grounding, through the elements included in this application.

The AEL-AE5 includes the following modules:

- N-ALI01. Industrial Main Power Supply.

- N-ALI03. AC Auxiliary Power Supply (24 VAC).

- N-CON01. 3-poles Contactor (24 VAC).

- N-REF. Single-Phase Fixed Resistor (4 units).

- N-REL23/A. Earth leakage relay.

- N-REL23/B. Overcurrent relay.

- N-TRA10. Current Transformer 25/5 A.

- N-TRA31. Current Transformer 1/1000 A.

Expansion learning software:

In addition, Edibon provides expansion learning software (AEL-AE5/ICAI) 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-AE5 can be mounted on rack (option A) or on rail (option B):

Option A:

This application needs the following racks:

- N-RACK-A.

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

Option B:

This application can be mounted on rail.

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

The application includes the following modules:

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

N-ALI01

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

   ON-OFF removable key.

   Output voltage connections:

      Three-Phase + Neutral: 400 VAC.

      Single-Phase: 230 VAC.

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

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

• N-ALI03. **AC Auxiliary Power Supply.**

N-ALI03

   Supply voltage (Single-Phase): 230 VAC PH+N+G

   Output voltage:

      Single-Phase 24 VAC/12 VAC.

      24 VDC.

      0-24VDC through potentiometer.

• N-CON01. **3-poles Contactor (24 VAC).**

N-CON01

   Nominal voltage for power contacts: 400 VAC.

   Nominal voltage for control contacts: 24 VAC.

   Nominal voltage for the control coil: 24 VAC.

   Contacts:

      One three-phase Normally Open Contact (NO) for power circuit.

      Three Normally Open Contacts (NO) for control circuit.

      Two Normally Close Contacts (NC) for control circuit.

   Ground terminal.

• N-REF. **Single-Phase Fixed Resistor (4 units).**

N-REF

   Value: 150 ohm.

   Maximum power: 500 W.

   Selector:

      Position 0:circuit opened.

      Position 1: circuit closed.

   Current fuse: 2 A.

Specifications

- N-REL23/A. **Earth leakage relay.**

  Power switch.

  Earth leakage relay.

  Reset push-button.

  Test push-button.

  Contacts:

  Two Normally Closed contact (NC).

  Indicator lamp.

  Terminals:

  Toroid connection.

  Power supply.

  Ground.

N-REL23/A

- N-REL23/B. **Over current relay.**

  Power switch.

  Latch switch.

  Over current relay.

  Normally Closed contact (NC).

  Terminals:

  Three input terminals.

  Output terminal.

  Power supply.

  Ground.

N-REL23/B

- N-TRA10. **Current transformer 25/5A.**

  Current transformer.

  Ratio: 25/5.

  Ground terminal.

N-TRA10

- N-TRA31. **Current transformer 1000/1A.**

  Current transformer.

  Ratio: 1000/1.

  Ground terminal.

N-TRA31

- **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.- Checking the woking of the main power supply.

2.- Checking the woking of the auxiliary power supply.

3.- Start up of a three-phase contactor.

4.- Calculation of the transformation ratio of a toroid.

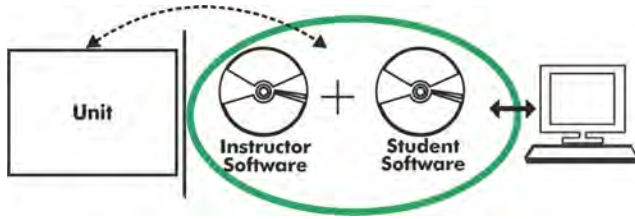5.- Start up of an overcurrent relay.

6.- Start up of an earth leakage relay.

REQUIRED SERVICES

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

DIMENSIONS AND WEIGHTS

AEL-AE5:
- Dimensions: 640 x 320 x 920 mm approx.

(25.19 x 12.59 x 32.22 inches approx.)
- Weight: 60 Kg approx.

(132 pounds approx.)

AEL-AE5/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.
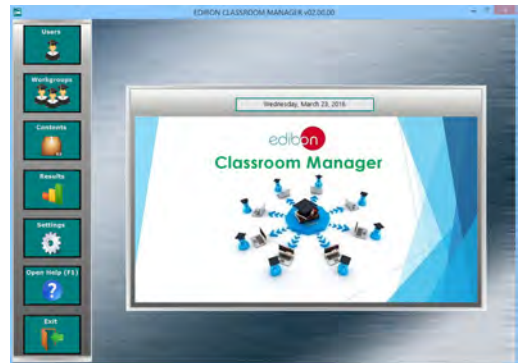
Instructor Software

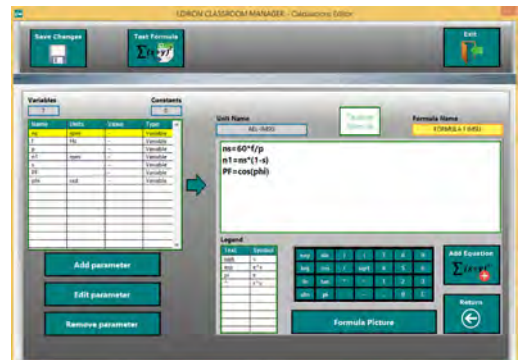- ECM-SOF. **EDIBON Classroom Manager (Instructor Software).**

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.
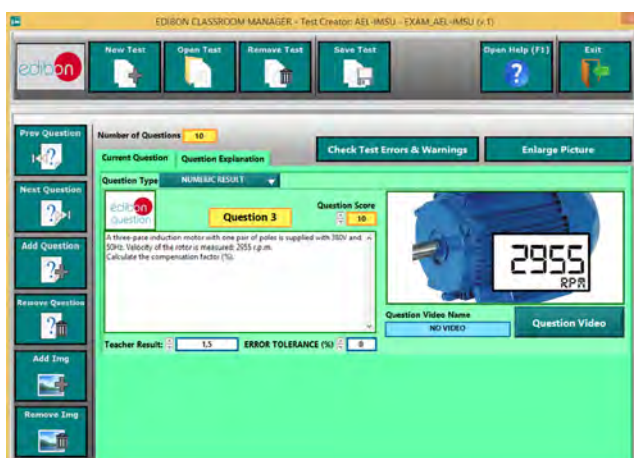
Innovative features:

• **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

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.
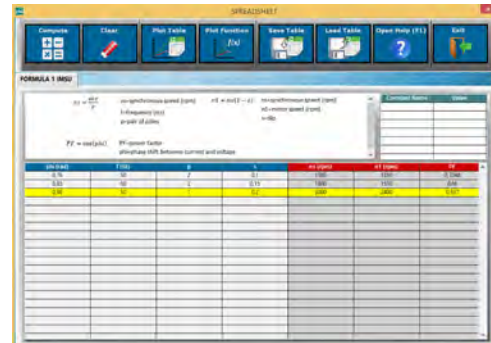
• Multimedia-Supported auxiliary resources.

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

EPE. EDIBON Practical Exercise Program Package Main Screen

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

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

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.

INTERNATIONAL

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REPRESENTATIVE: