edibon

Engineering and Technical Teaching Equipment

INTRODUCTION

The electric motors are devices capable of transforming electrical energy into mechanical energy. The shaft of the motors are driven by the magnetic forces develped between the armature and field. The DC compound excitation motors have special characteritics to be used in applications that require moderate torques such as lathes, fans, pumps disc, etc. For this purpose it is very important to know several operations carried out with these electrical machines.

The Application of DC Compound Excitation Motor "AEL-DCCOA" is designed for the study of the main operations performed in the industrial field with DC compound excitation motors.

The student will understand the most important operations of these electrical machines faithfully by using commutators and speed controllers.

The AEL-DCCOA includes the following modules:

- N-ALI02. Main Power Supply.

- N-PUL48. 3 Double Chamber Push-Buttons.

- N-LAM02. Auxiliary Lamps.

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

- N-ALI03. AC Auxiliary Power Supply.

- FLYW. Flywheel.

- N-VVCC/M. DC Motor Speed Controller (Intermediate option).

- N-REV. Variable Resistor. (2 units)

- EMT4. DC Compound excitation motor-generator.

Additional and recommended measurement instrumentation modules:

- Digital Instrumentation:

  - N-EAL-DC. DC Network Analyzer Unit.

- Analog Instrumentation:

  - N-MED17. DC Voltmeter (0-200 V).

  - N-MED05. DC Ammeter (0-1.5 A).

If the Option A (modules mounted on rack) is chosen, the rack/s required will depend on the optional modules requested by the customer.

Expansion learning software:

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

Option A:

This application needs the following rack:

  - 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-ALI02. Domestic Power Supply.**

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

  ON-OFF removable key.

  Output Voltage Connections:

  Two Single-Phase: 230 VAC.

  Single-Phase supply hose connecting plug.

  Differential magnetothermal, 2 poles, 25 A, 30 mA AC 6 KA.

N-ALI02

- **N-PUL48. 3 Double Chamber Push-Buttons.**

  Two independent chambers.

  Nominal voltage: 24 VAC.

  Three double chamber push-buttons (green and red).

  Contacts:

  Three Normally Open Contacts (NO) for green switch.

  Three Normally Close Contacts (NC) for red switch.

  Ground terminal.

N-PUL48

- **N-LAM02. Auxiliary Lamps.**

  Nominal voltage: 24 VAC.

  Three lamps (red, yellow and green).

  Ground terminal.

N-LAM02

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

  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-CON01

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

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

  Output voltage:

  Single-Phase 24 VAC/12 VAC.
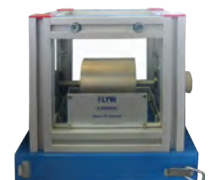
  24 VDC.

  0-24 VDC through potentiometer.

N-ALI03

- **FLYW. Flywheel.**

  Weight: 2 kg.

  Maximum recommended speed: 4000 r.p.m.

  Moment of inertia: 0,0025 kgm ^{2}.

FLYW

- **N-VVCC/M. DC Motor Speed Controller (Intermediate option).**

  Supply voltage: 230 VAC.

  Variable output voltage: 0-300 VCC.

  Fuse: 2 A.

N-VVCC/M

- N-REV. **Variable Resistor. (2 units)**

    Variable resistor of 150 Ohm.

    Maximum power: 500 W.

    Potentiometer.

    Terminals:

        Three terminals to choose all resistance or variable resistance.

        Fuse: 2 A.

N-REV

- EMT4. **DC Compound Excitation Motor-Generator.**

    Nominal power: 250 W.

    Armature voltage: 200 VDC.

    Armature current: 1,5 A.

    Excitation current: 0,3 A.

    RPM: 3000 r.p.m.

EMT4

Additional and recommended measurement instrumentation modules:

- N-EAL-DC. **DC Network Analyzer Unit.**

    This unit shows the main electric parameters on the electric loads throught the interface and a parameters selection.

    1 Current input.

    1 Terminal voltage.

    Visualization digital display:

        Voltage: Range 0 - 450 Vdc without transformer.

    Current: Range 0-5 A.

    Power.

        Power supply connection: 38 - 265 VAC/DC.

        Resolution: 0.1 V; 0.01 A; 0.01 KW.

        Energy total: 6 DGT (0.1 KWh).

N-EAL-DC

- N-MED17. **DC Voltmeter (0-200 V).**

    Measurement range: 0-200 VDC.

    Terminals:

        Measurement terminals.

        Ground terminals.

N-MED17

- N-MED05. **DC Ammeter (0-1.5 A).**

    Measurement range: 0-2 ADC.

    Terminals:

        Measurement Terminals.

        Ground Terminal.

        Fuse: 3 A.

N-MED05

- **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.- DC motor speed control.

2.- DC machine turning direction control.

3.- DC machine speed reading.

4.- Armature current control.

5.- Field current control.

REQUIRED SERVICES

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

DIMENSIONS AND WEIGHTS
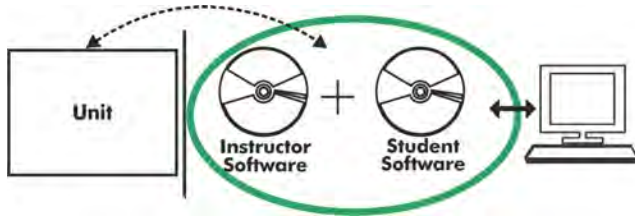
AEL-DCCOA:

-Dimensions: 640 x 320 x 920 mm approx.

(25.19 x 12.59 x 36.26 inches approx.)

-Weight: 25 Kg approx.

(55 pounds approx.)

AEL-DCCOA/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.
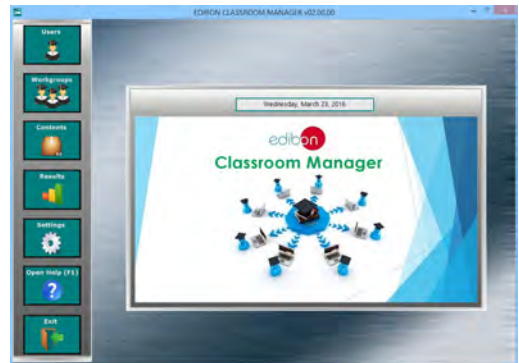
Instructor Software

- 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.**

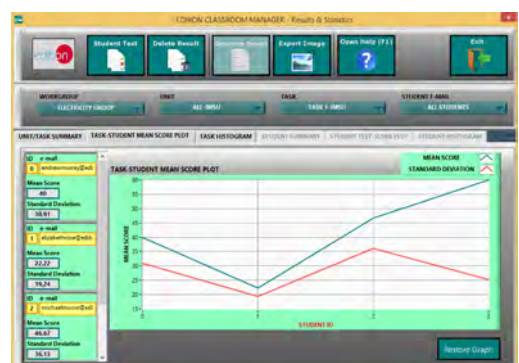• **Report generation, User Progression Monitoring and Statistics.**

ECM-SOF. EDIBON Classroom Manager (Instructor Software)
Application Main Screen
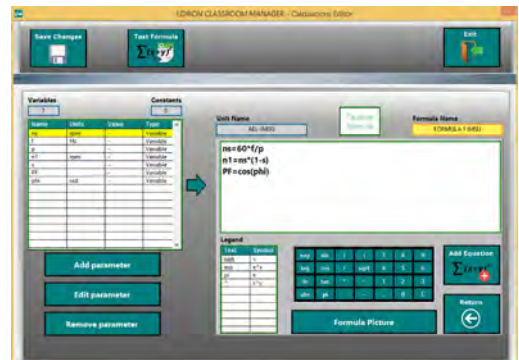
ECAL. EDIBON Calculations Program Package - Formula
Editor Screen
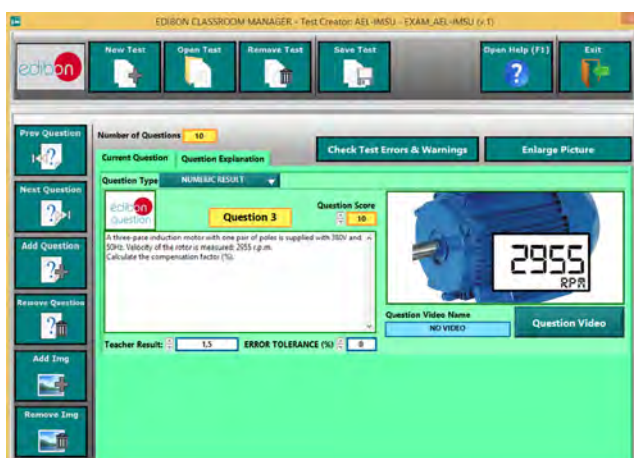
ETTE. EDIBON Training Test & Exam Program Package - Main Screen with
Numeric Result Question

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
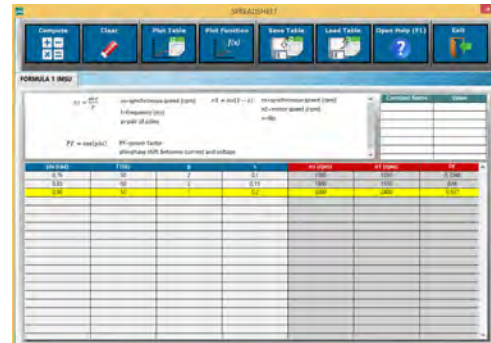
ECAL. EDIBON Calculations Program Package Main Screen

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

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