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 ↳ PRODUCTS
 ↳ 40.- ELECTRICITY

INTRODUCTION

The electric motors are devices capable of transforming electrical energy into mechanical energy. The DC shunt excitation motors are very used in industrial installations. The starting current consumed by these motors is very high, being harmful to the machine and the protections. The variable speed controllers aim at reducing these currents close to the nominal values. In the industry some times it is very important using data acquisition systems to measure signals to check the electrical machines performance.



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 Shunt Excitation Motor Application "AEL-DCSHT" has been designed by EDIBON to study the electrical characteristics and mechanical parameters of Shunt Wound DC Motors. This application allows the students to acquire a basic knowledge about different methods to obtain characteristic curves of the DC motors. For this purpose, the trainer includes a series of measurement devices, such as mechanical torque measurement unit, analog ammeter, analog voltmeter, multimeter and manual speed meter. All these elements included are indispensable to study the DC Motor characteristics.

Additionally it is recommended the EM-SCADA, a revolutionary Data Acquisition Software developed by Edibon that allows monitoring all voltages, currents and torque waveforms in order to study in depth the machine. Through the EM-SCADA the user can carry out a DC Motor electrodynamic study with braking tests and to obtain the results after analysis.

The AEL-DCSHT includes the following modules:

- N-ALI02. Domestic Power Supply.
- FRECP/LC. Eddy Current Brake with Load Cell.
- EMT3. DC Shunt excitation motor-generator.
- N-WVCC/M. DC Motor Speed Controller (Intermediate option).
- N-WVCC. Advanced DC Motor Speed Controller.
- N-MED65. Digital Multimeter.
- TECNEL/TM. Optical Speed Meter.
- N-REV. Variable Resistor.
- N-TM. Torque Measurement Unit.
- N-MED05. DC Amperimeter (0-1,5 A).
- N-MED17. DC Voltmeter (0-200 V).

Expansion testing software:

- EM-SCADA. Control and Data Acquisition System Software for Electrical Machines, with SCADA.

Expansion learning software:

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

Option A:

This trainer 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 trainer can be mounted on rail.

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

SPECIFICATIONS

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

- **FRECP/LC. Eddy Current Brake with Load Cell.**

Nominal current: 1,6 A.

Nominal braking torque: 1,4 Nm.

Maximum current: 1,8 A (do not exceed 10 seconds).

Maximum braking torque: 1,7 Nm.



FRECP/CL

- **EMT3. DC Shunt Excitation Motor-Generator.**

Nominal power: 300 W.

Nominal voltage: 200 V.

Nominal current: 1,5 A.

RPM: 3400 r.p.m.



EMT3

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

Supply voltage: 230 VAC.

Variable output voltage: 0-300 VCC.

Fuse: 2 A.



N-WCC/M

- **N-WCC. Advanced DC Motor Speed Controller.**

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

Three ON-OFF switches:

ON-OFF power switch.

Star-Stop control activation switch.

Internal tacho dynamo feedback switch.

Two potentiometers:

Speed control.

Torque control.

Terminals:

Rotor terminals.

Excitation terminals.

Tacho dynamo terminals.

Three driver status leds: (red, yellow and green).

Variable output voltage: 0-300 VCC.

Fuses:

One of 1 A.

One of 2 A.



N-WCC

Specifications

- **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

- **TECNEL/TM. Optical Speed Meter.**

The tacho dynamo is an element used to measure the electrical motors rotation speed.

For this purpose, this device has a series of switches for different operation methods:

- m/min.
- rpm contact.
- rpm photo.



TECNEL/TM

- **N-REV. Variable Resistor.**

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

- **N-TM. Torque Measurement Unit.**

Single phase power supply: 230 VAC.

GND.

Power switch.

Signals connection



N-TM

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

Measurement range: 0-200 VDC.

Terminals:

Measurement terminals.

Ground terminals.



N-MED17

- **N-MED05. DC Ammeter (1-1, 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.- Checking the N-ALI02 main power supply.
- 2.- Wiring and starting of Shunt Wound DC Motor.
- 3.- Use of measurement instrumentation.
- 4.- Braking test with Eddy Current Brake and Shunt Wound DC Motor.
- 5.- Obtaining of performance curve of the Shunt Wound DC Motor.
- With EM-SCADA. Control and Data Acquisition System of Electrical Motors:
- 6.- Torque/Speed measurement waveforms.
- 7.- Real Time Measuring and Monitoring of Voltages, Currents, Active Power, Reactive Power, Power Factor, etc.
- 8.- Electrodynamics study of electrical machines.
- 9.- Obtained results storage.
- 10.- Braking tests and monitoring of results in real time.

REQUIRED SERVICES

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

DIMENSIONS AND WEIGHTS

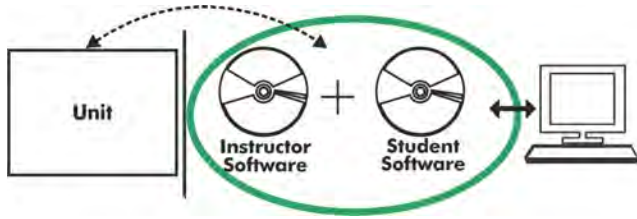
- AEL-DCSHT:
- Dimensions: 640 x 320 x 920 mm approx.
(25.19 x 12.59 x 36,22 inches approx.)
 - Weight: 45 Kg approx.
(99 pounds approx.)

OPTIONAL SOFTWARE

- EM-SCADA. Control and Data Acquisition System Software for Electrical Machines, with SCADA. (For more information see catalogue. Click on the following link: <http://www.edibon.com/en/files/equipment/EM-SCADA/catalog>)

Optional

AEL-DCSHT/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.

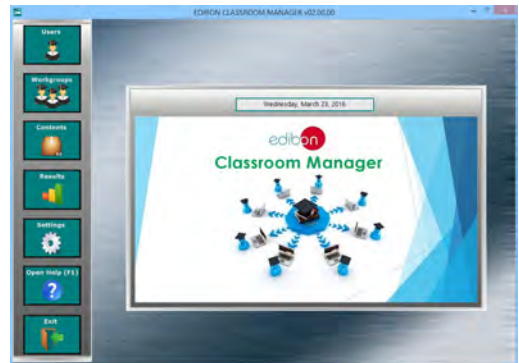
Instructor Software

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

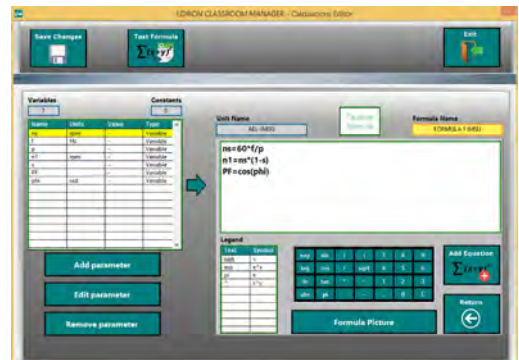
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual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

Innovative features:

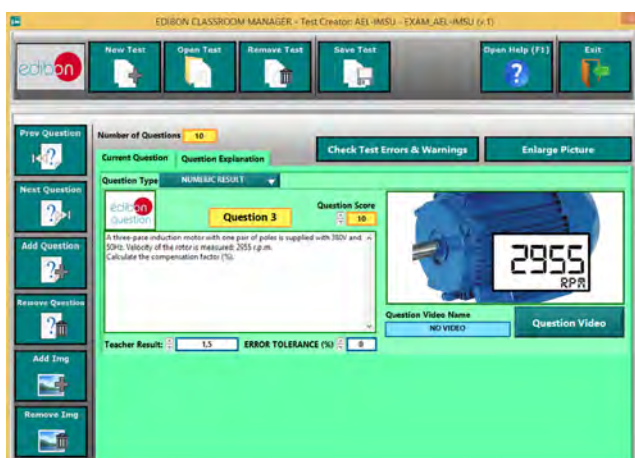
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.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



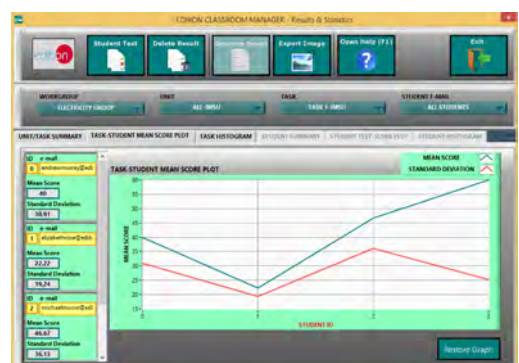
ECM-SOF. EDIBON Classroom Manager (Instructor Software) Application Main Screen



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



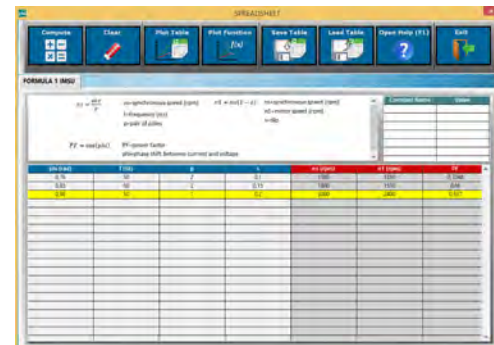
ESL-SOF. EDIBON Student LabSoft (Student Software)
Application Main Screen



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.



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REPRESENTATIVE:

