edibon

Engineering and Technical
Teaching Equipment

MPCO

PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION
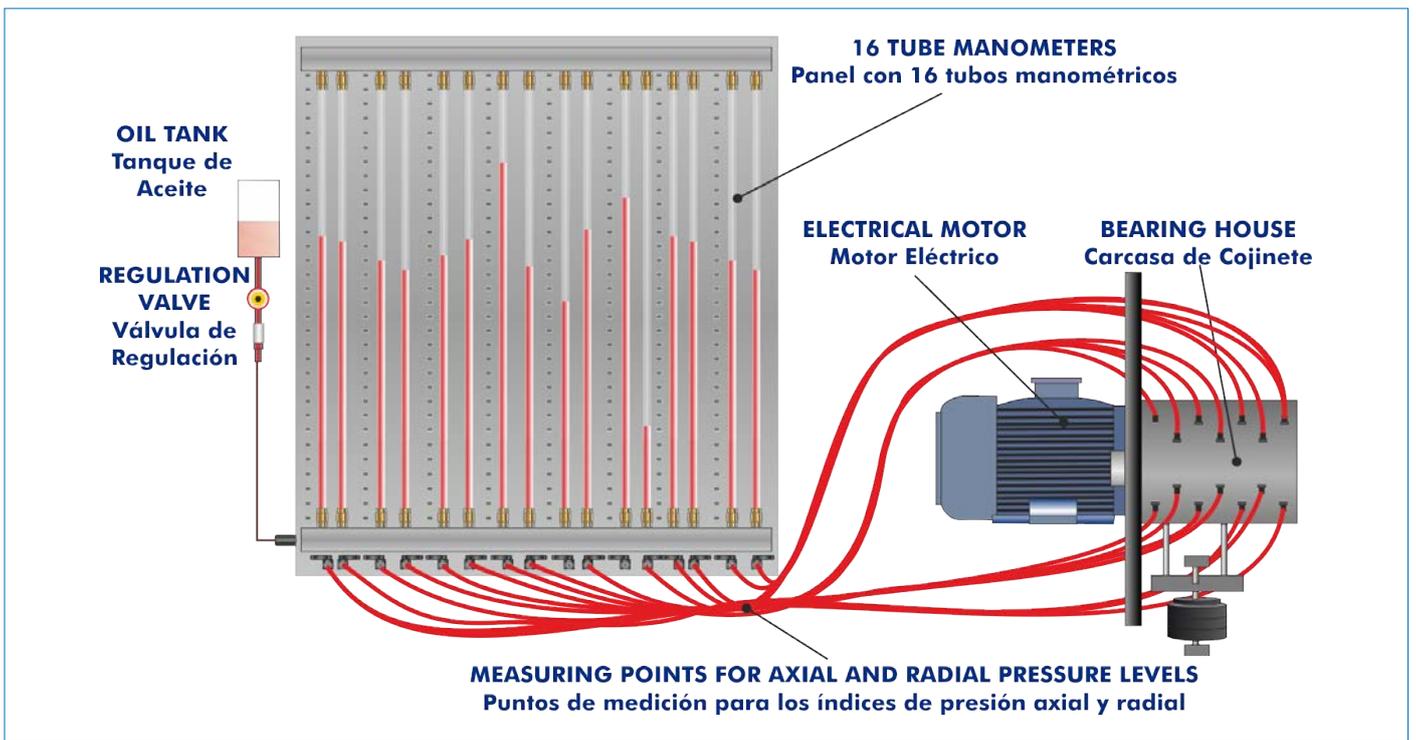
16 TUBE MANOMETERS
Panel con 16 tubos manométricos

OIL TANK
Tanque de
Aceite

**REGULATION
VALVE**
Válvula de
Regulación

ELECTRICAL MOTOR
Motor Eléctrico

BEARING HOUSE
Carcasa de Cojinete

MEASURING POINTS FOR AXIAL AND RADIAL PRESSURE LEVELS
Puntos de medición para los índices de presión axial y radial

INTRODUCTION

A journal bearing is a cylindrical element made of a suitable material and containing properly machined inside and outside diameters. Journal bearings are usually used in a wide variety of machines, where satisfactory performances are necessary for proper functioning, such as pumps, turbines, compressors, etc.

The Journal Bearing Unit, "MPCO", enables to exert friction in a journal bearing in order to study the pressure distribution under various conditions of load and speed and illustrates the principle of hydrodynamic lubrication.

GENERAL DESCRIPTION

The Journal Bearing Unit, "MPCO", allows to study the pressure distribution in sliding bearings. It illustrates the principle of hydrodynamic lubrication.

The unit is mounted on a metallic structure assembled on wheels for its mobility.

The sliding bearing consists of a journal bearing driven by an electrical motor and a freely moving bearing housing. The bearing can be loaded with different interchangeable weights. The journal bearing shifting and the oil film can be seen through a transparent bearing housing.

The distribution of pressure and the carrying capacity can be determined on a sliding bearing model at different bearing loads and speeds.

The radial and the axial distribution of pressure of the oil film in the sliding bearing can be recorded in the bearing gap at 12 equi-spaced pressure tappings around its perimeter and four along the length. All pressure tappings are connected by flexible plastic tubes to the rear multi-manometer panel with 16 tube manometers mounted on board, to show the pressure of oil at all 16 points at all times.

The loads are applied using a hanger and a weights set. The motor speed is controlled from an electronic console.

The unit includes an adjustable methacrylate tank to fill it with oil.

SPECIFICATIONS

Anodized aluminum frame and panels made of painted steel.

The unit includes wheels to facilitate its mobility.

Main metallic elements made of stainless steel.

Diagram in the front panel with distribution of the elements similar to the real one.

Sliding bearing:

   The sliding bearing consists of a journal bearing driven by an electrical motor and a freely moving bearing housing. It includes 16 pressure tappings to measure the radial and the axial distribution of pressure of the oil in the sliding bearing.

   Nominal bearing diameter: 52 mm approx.

   Bearing gap: 4 mm approx.

   Bearing width: 75 mm approx.

   Bearing load, range: 6.5 – 16.5 N approx.

Motor:

   Power output: 0.37 KW approx.

   Max. speed: 3000 rpm approx.

A multi-manometer to display the radial and axial pressure distribution of the oil film in the sliding bearing. It includes 16 tube manometers of 1750 mm length.

A methacrylate tank for oil, volume: 3.5 l approx.

Set of weights: up to 10 N.

Electronic console, including:

   Metallic box.

   Motor connector.

   Motor speed controller.

   Digital display for the motor speed.

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.- Demonstration of the principle of hydrodynamic lubrication.

2.- Relocation of the shaft journals in relation to speed.

3.- Determination of the pressure distribution in the bearing with constant load and at various speeds.

4.- Comparison of theoretical pressure profiles with practical results.

5.- Observation of oil wedge (film thickness) and hence eccentricity variations for different speeds and loads.

6.- Demonstration of the critical speed in relation to load.

7.- Demonstration of the critical speed and viscosity in relation to oil temperature.

8.- Demonstration of self-excited vibrations.

REQUIRED SERVICES

- Electrical supply: single-phase, 220 V/50 Hz or 110 V/60 Hz.
- Oil.

DIMENSIONS AND WEIGHTS

MPCO:

  -Dimensions: 1200 x 800 x 2700 mm approx.

  (47.24 x 31.49 x 106.29 inches approx.)

  -Weight: 65 Kg approx.

  (143.30 pounds approx.)

MPCO/ICAI. Interactive Computer Aided Instruction Software System:
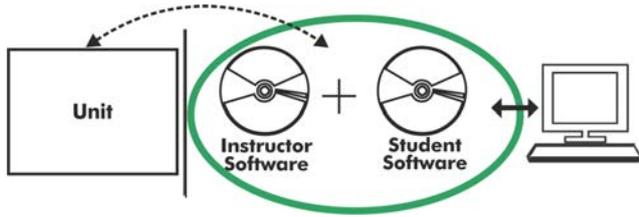
With no physical connection between unit and computer, **this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF).** Both are interconnected so that the teacher knows at any moment 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.
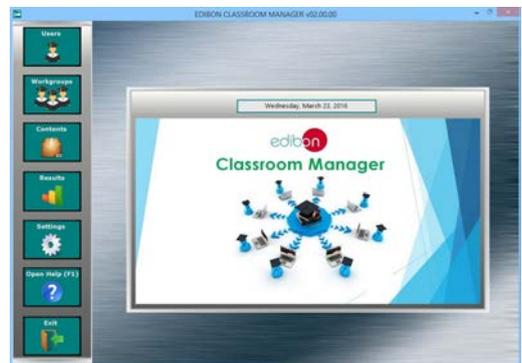
ECM-SOF. EDIBON Classroom Manager (Instructor Software)
Application Main Screen
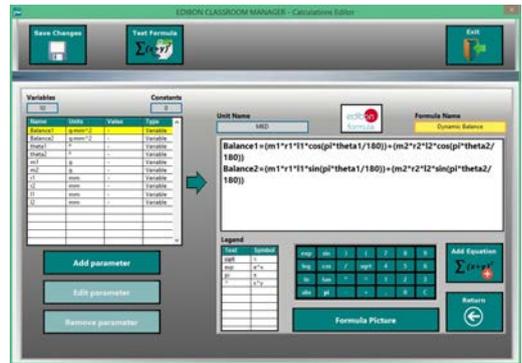
ECAL. EDIBON Calculations Program Package - Formula Editor
Screen
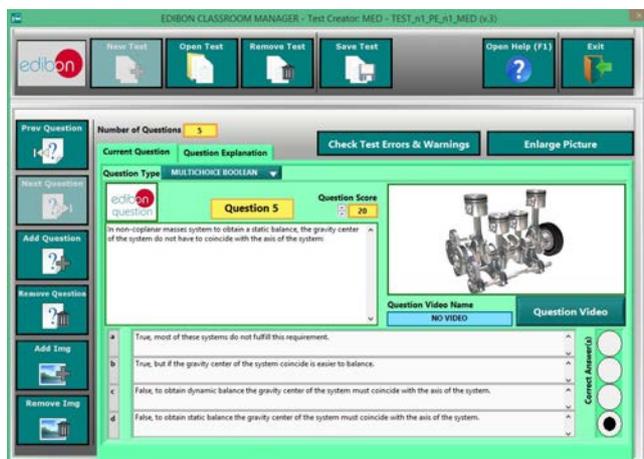
ETTE. EDIBON Training Test & Exam Program Package - Main Screen with
Numeric Result Question
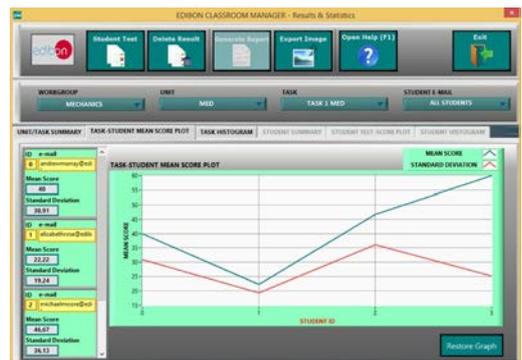
ERS. EDIBON Results & Statistics Program Package - Student
Scores Histogram

- 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
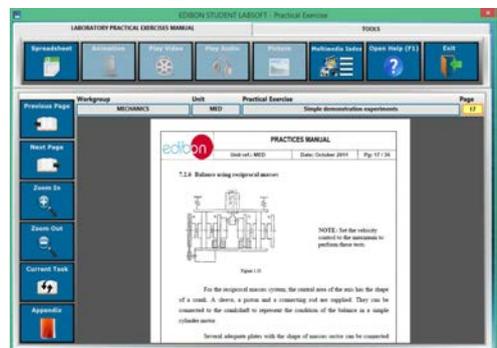
EPE. EDIBON Practical Exercise Program Package Main Screen
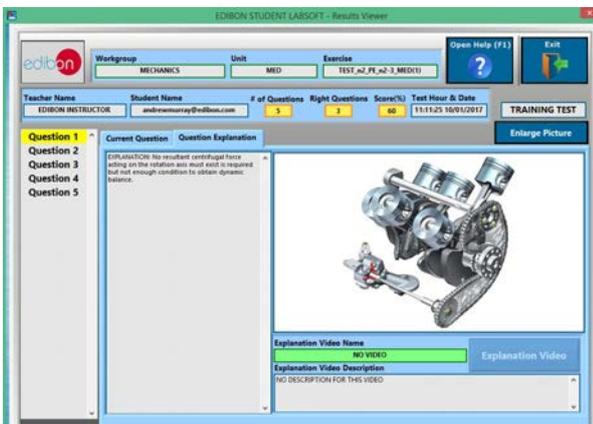
ERS. EDIBON Results & Statistics Program Package - Question Explanation
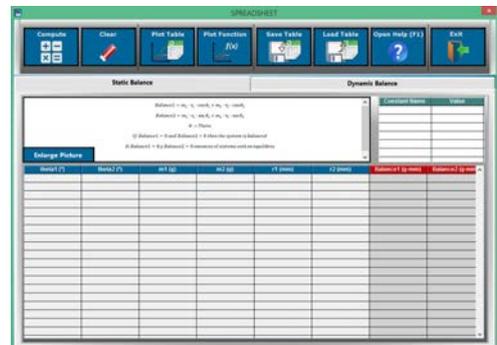
ECAL. EDIBON Calculations Program Package Main Screen

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

INTERNATIONAL

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