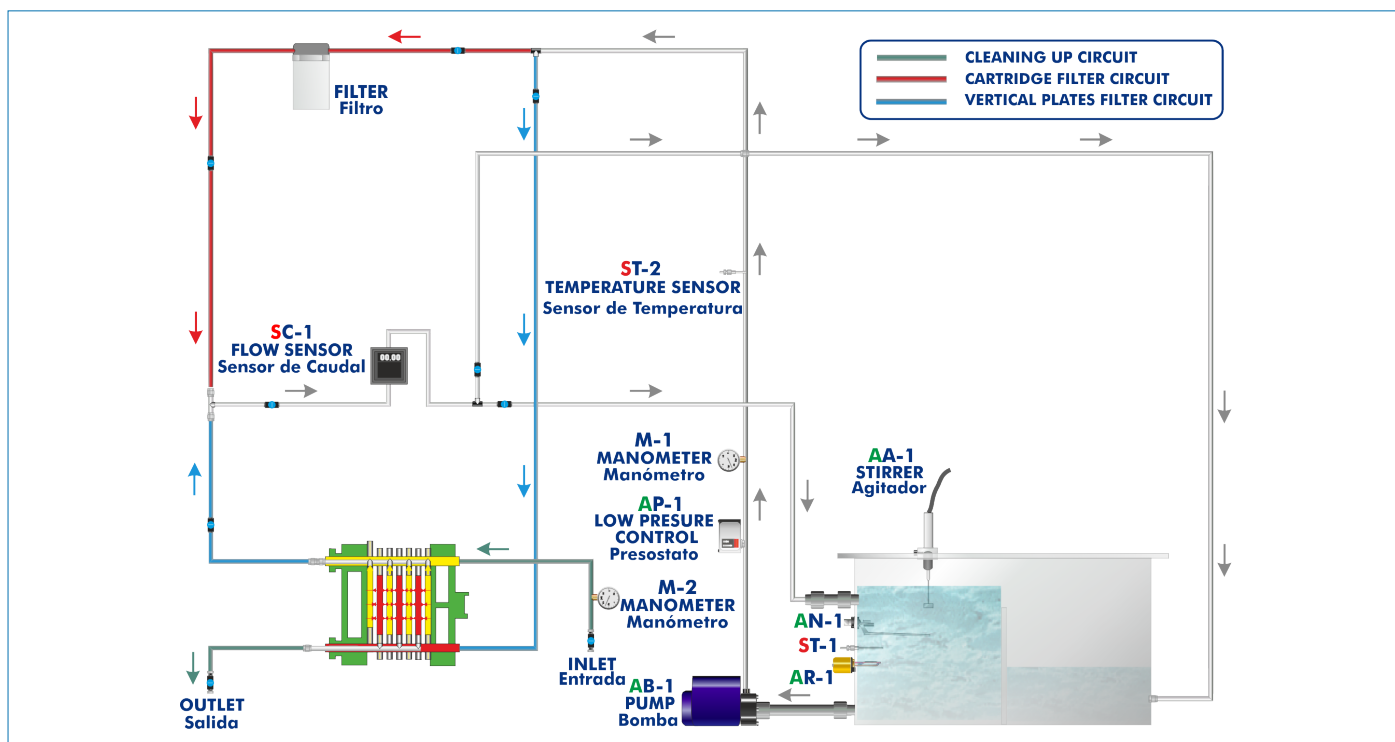


Electronic console

PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION



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)



"Worlddidac Quality Charter" and Platinum Member of Worlddidac

INTRODUCTION

Filtration is a basic operation, widely used in the chemical industry, consisting in the separation of solid particles in a suspension using a filter medium through which only the liquid can pass. The solid particles are retained on the filter medium and form a porous bed, known as cake, through which the fluid flows.

The Continuous and Batch Filtration Unit, "TFUB", has been designed to understand the principles of continuous and batch filtration at constant pressure and constant flow operation.

GENERAL DESCRIPTION

This filtration unit has been designed to study the filtration process with two different types of filters. On one hand, there is a vertical plate filter consisting of nylon plates with a diameter of 5 microns, used to filter a known concentration CaCO_3 suspension. On the other hand, there is a cartridge filter, more suitable for continuous filtration of larger size materials. It will be used to filter and "clean" a water sample with small pieces of paper.

To carry out the experiments, the mixture will be taken from a tank by a variable speed centrifugal pump and send to one of the filters depending on the position of the valves. A motor driven stirrer will make the sample inside the tank more homogeneous.

Along its way, the mixture goes through two manometers and a flow sensor, which will help us to determine the flow through the circuit. The initial temperature of the sample can be controlled by a heating element and a temperature sensor, which will provide the temperature value at any time.

There are two operation modes with the unit: the filtered product can be sent to the initial tank to be filtered again or to a "product tank" to be analyzed after passing through the filters only once.

SPECIFICATIONS

Bench-top unit.

Anodized aluminum frame and panels made of painted steel.

Main metallic elements made of stainless steel.

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

This filtration unit demonstrates the principles of continuous and batch filtration.

Double tank (capacity: 9 l), made of methacrylate.

Level switch in the tank.

Stirrer.

Centrifugal pump regulated by a potentiometer max. 4 bar.

Heating element, power: 500 W.

Vertical plates filter, composed of 4 nylon plates of 5 microns diameter, allowing us to filter the CaCO_3 suspension of known concentration.

Cartridge filter will filter and "clean" a water sample with small pieces of paper.

Two temperature sensors, "J" type.

Two pressure gauges (manometers), range: 0 – 4 bar.

Flow sensor, range: 0.1 – 25 l/min.

Safety pressure switch, range: 0 – 7.5 bar.

Water and calcium carbonate are the recommended working materials for reasons of safety and ease to use.

Electronic console:

Metallic box.

Main switch.

Connections for the temperature sensors. Selector for the temperature sensors. Digital display for the temperature sensors.

Connection for the flow sensor. Digital display for the flow sensor.

Heating element switch. Heating element controller.

Pump switch. Pump regulator.

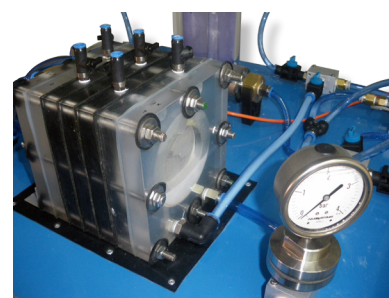
Stirrer switch.

Level switch connection.

Pressure switch connection.

Cables and Accessories, for normal operation.

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



TFUB detail

EXERCISES AND PRACTICAL POSSIBILITIES

- | | |
|---|--|
| <ol style="list-style-type: none">1.- Understanding the principles of continuous and batch filtration using both constant pressure and constant flow operating modes (vertical plates and cartridge filters).2.- Study of the plates filter at a constant pressure.3.- Study of the plates filter at a constant flow.4.- Study of the cartridge filter at constant pressure.5.- Study of the cartridge filter at constant flow.6.- Demonstrating filtration through membrane technology.7.- Precoat and body aid filtration.8.- Optimisation of filtration performance using body aid.9.- Determination of medium and cake resistances.10.- Effect of body aid on medium and cake resistances. | <p>Additional practical possibilities to be done by the end customer:</p> <ol style="list-style-type: none">11.- Mass balancing.12.- Demonstration of Darcy's Law.13.- Filter cake washing and dewatering.14.- Study of commercial aspects of filtration and optimisation of filtration operations. |
|---|--|

REQUIRED SERVICES

- Electrical supply: single-phase 200 VAC – 240 VAC/50 Hz or 110 VAC – 127 VAC/60 Hz.
- Water supply.

DIMENSIONS AND WEIGHTS

- TFUB:
Unit:
- Dimensions: 1100 x 600 x 450 mm approx.
(43.30 x 23.62 x 17.71 inches approx.)
 - Weight: 30 kg approx.
(66 pounds approx.)
- Electronic console:
- Dimensions: 490 x 330 x 310 mm approx.
(19.29 x 12.99 x 12.20 inches approx.)
 - Weight: 12 kg approx.
(26.45 pounds approx.)

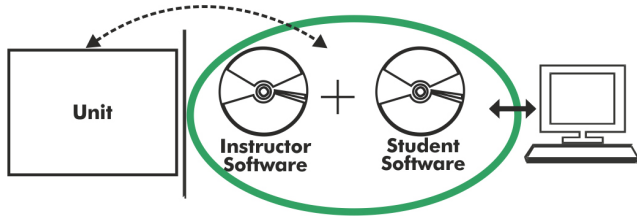
RECOMMENDED ELEMENTS (Not included)

- Turbidity meter.

AVAILABLE VERSIONS

- | |
|--|
| <p><u>Offered in this catalogue:</u></p> <ul style="list-style-type: none">-TFUB. Continuous and Batch Filtration Unit. |
| <p><u>Offered in other catalogue:</u></p> <ul style="list-style-type: none">-TFUC. Computer Controlled Continuous and Batch Filtration Unit. |

TFUB/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.

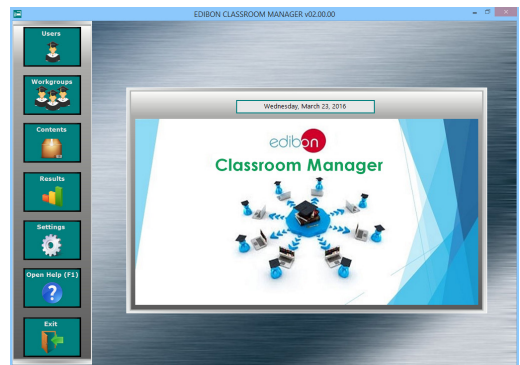
Instructor Software

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

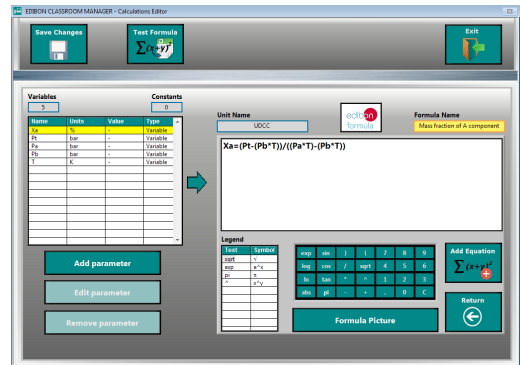
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual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

Innovative features:

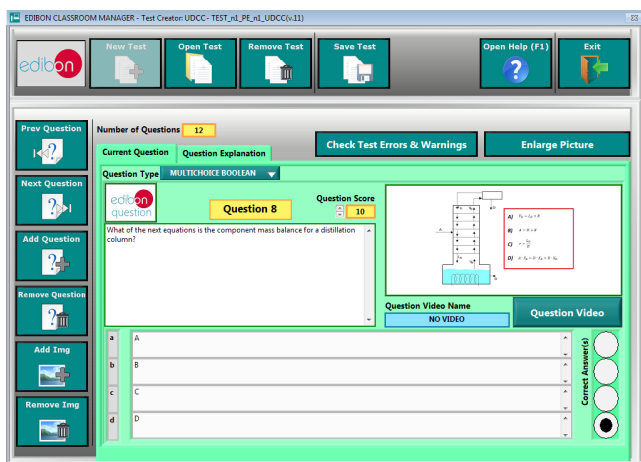
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.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



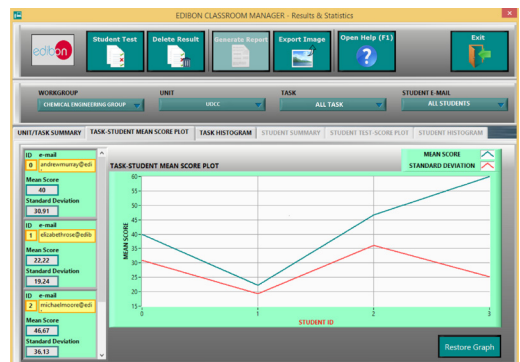
ECM-SOF. EDIBON Classroom Manager (Instructor Software) Application Main Screen



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

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:

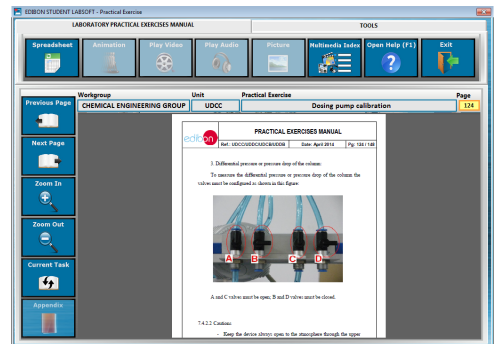
- Student Log-In & Self-Registration.
- Existing Tasks checking & Monitoring.
- Default contents & scheduled tasks available to be used from the first session.
- Practical Exercises accomplishment by following the Manual provided by EDIBON.
- Evaluation Methods to prove your knowledge and progression.
- 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:

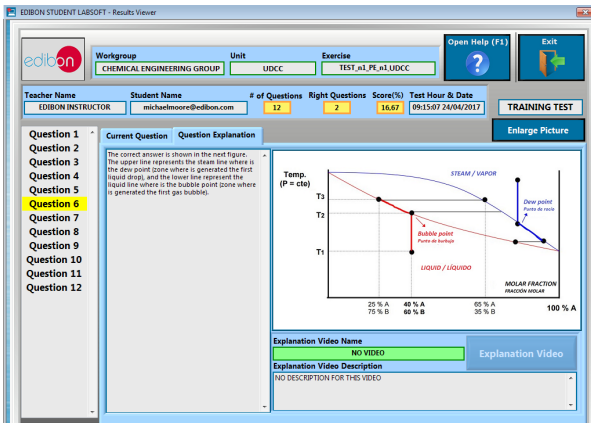
www.edibon.com/en/files/expansion/ICAI/catalog



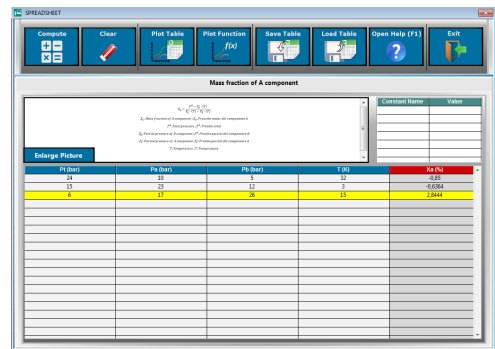
ESL-SOF. EDIBON Student LabSoft (Student Software) Application Main Screen



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/ Julio Cervera, 10-12-14. Móstoles Tecnológico.
28935 MÓSTOLES. (Madrid). ESPAÑA - SPAIN.
Tel.: 34-91-6199363 Fax: 34-91-6198647
E-mail: edibon@edibon.com Web: www.edibon.com

Edition: ED01/19
Date: May/2019

REPRESENTATIVE:

