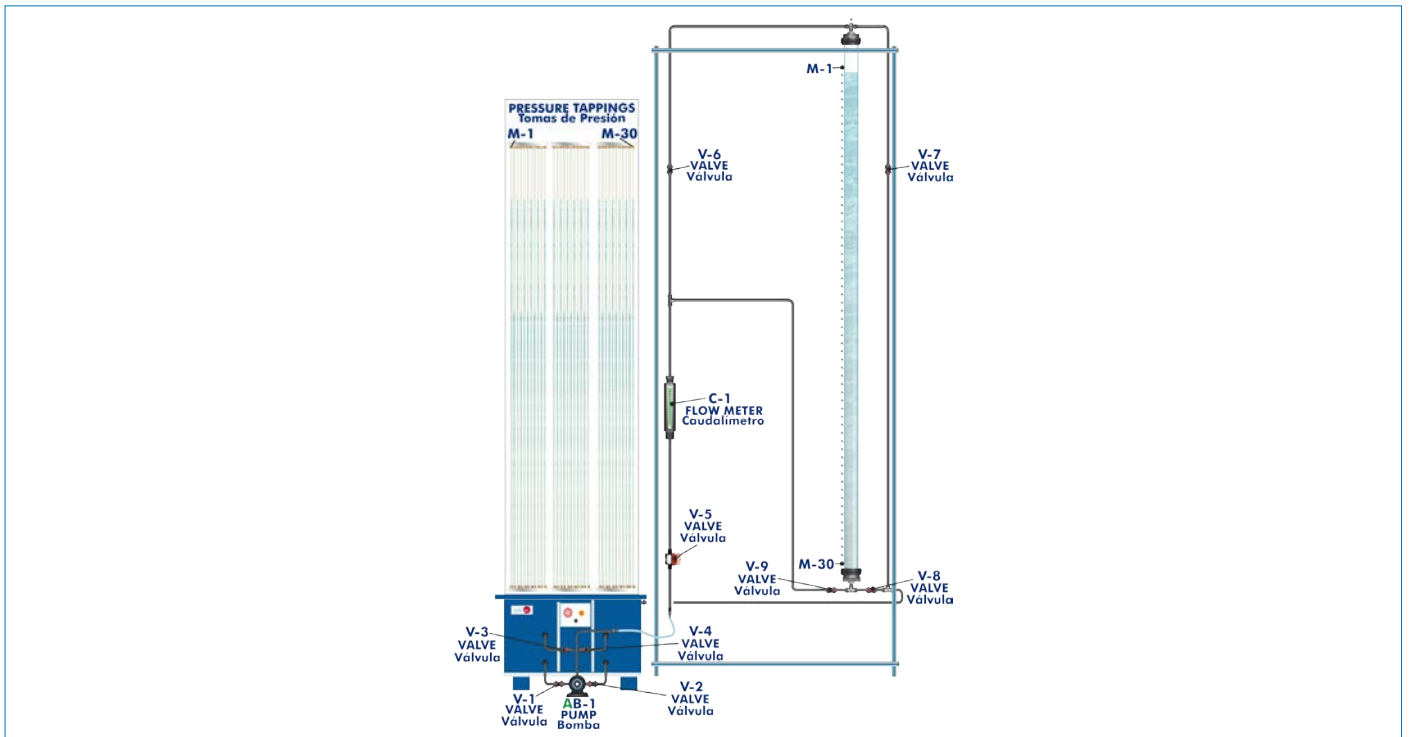




## PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION



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 the separation of a mixture of solids and fluids that includes the passage of most of the fluid through a porous media, which retains most of the solid particles of the mixture. The filtering media is the barrier that enables the passage of the liquid while it retains most of the solids, which accumulate in a layer over the surface or filter (filtering bed), so the fluid will go through the solids bed and the retention membrane.

Students can visualize and study one of most common water treatment processes aimed at supplying cities and for industrial uses with this unit.

The Deep Bed Filter Unit, "EFLP", enables to study filtration in open and closed circuit, as well as to visualize the bed washing process.

## GENERAL DESCRIPTION

The Deep Bed Filter Unit, "EFLP", allows us to filter a fluid in order to eliminate particles in suspension, to have it in more adequate conditions for its subsequent use or consumption.

The pump takes raw water from one of the reservoirs of the unit and propels it towards the upper part of the column. That raw water passes through a diaphragm valve that controls the inlet flow rate of the column and a flowmeter that measures such flow rate.

The liquid to be filtered goes down the column, crossing the filtering media settled as a bed and the pressure along the entire bed is measured at 30 points. It enables the measurement of the pressure drop that is visualized by the increase of the resistance that the filter opposes to the fluid.

The filtration process can be performed in closed or open circuit.

The solids settled in the filter can be removed by countercurrent washing.

## 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.

Filter column, where the porous media is formed:

It includes the following elements:

Transparent PMMA tube of circular section (column height: 1300 mm), with removable top and bottom covers.

Support filter of the porous bed.

Filtering bed.

Thirty pressure takings.

Thirty sample capturing takings.

Tank:

Its objective is to prepare the suspension for being filtered. There is a tank with two reservoirs:

Reservoir 1 = 350 l.

Reservoir 2 = 350 l.

Total capacity: 700 l.

Both reservoirs have water height level.

Pump:

Centrifugal pump.

In order to take the fluid to the upper part of the filter column (filtering operations), or the bottom part of the column (washing operation of the porous bed).

Pipes and valves system to establish several circuits and regulate the flows.

Flowmeter, rotameter type, range: 50 – 600 l/h.

Manometric board:

The filtering column has static pressure takings to which the piezometric tubes are coupled.

Number of piezometric tubes: 30.

Column height: 1300 mm.

Air purger for eliminating bubbles which are initially in the circuit.

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.



EFLP detail

## EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- Determination of the initial head loss of a deep bed.
- 2.- Evolution through time of the head loss of the deep bed.
- 3.- Measuring pressure drop profiles through the bed.
- 4.- Demonstration of reversed flow and backwashing fluidisation.
- 5.- Filtering in open and closed circuit.
- Additional practical possibilities:
- 6.- The column may be readily adapted for absorption and ion exchange studies.
- 7.- Measuring suspension concentration profiles through the filter bed.
- 8.- Filtration efficiency. Clarification.

### REQUIRED SERVICES

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

### DIMENSIONS AND WEIGHTS

- EFLP:
- Dimensions: 1 600 x1500 x 2500 mm approx.  
(62.99 x 59.05 x 98.42 inches approx.)
  - Weight: 275 kg approx.  
(605 pounds approx.)

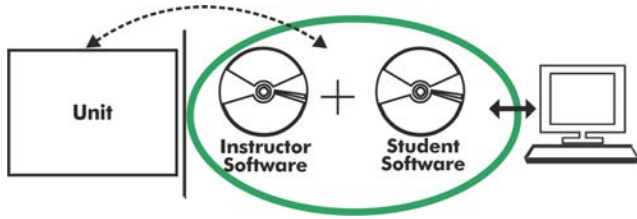
### ADDITIONAL RECOMMENDED ELEMENTS (Not included)

- Bottles for collecting samples.
- Turbidity meter or spectrophotometer.

### SIMILAR UNITS AVAILABLE

- EFLP. Deep Bed Filter Unit.
  - Offered in this catalog:
- EFLPC. Computer Controlled Deep Bed Filter Unit.
  - Offered in other catalog:

**EFLP/ICAI. Interactive Computer Aided Instruction Software:**



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.

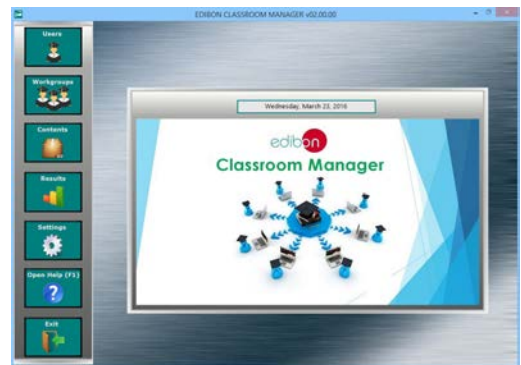
Instructor Software

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

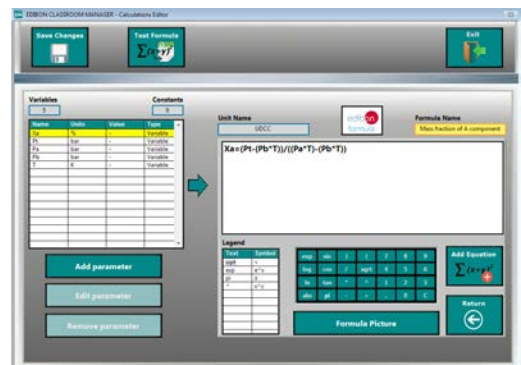
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual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

Innovative features:

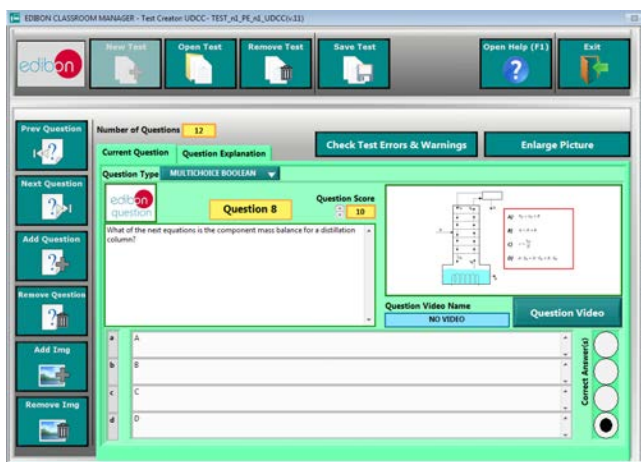
- User Data Base Management.
- Administration and assignment of Workgroup, Task and Training sessions.
- Creation and Integration of Practical Exercises and Multimedia Resources.
- Custom Design of Evaluation Methods.
- Creation and assignment of Formulas & Equations.
- Equation System Solver Engine.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

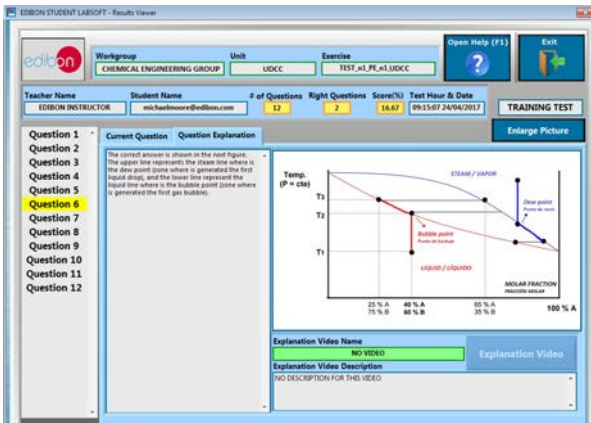
[www.edibon.com/en/files/expansion/ICAI/catalog](http://www.edibon.com/en/files/expansion/ICAI/catalog)



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](mailto:edibon@edibon.com) Web: [www.edibon.com](http://www.edibon.com)

Edition: ED01/20  
Date: July/2020

REPRESENTATIVE:

