

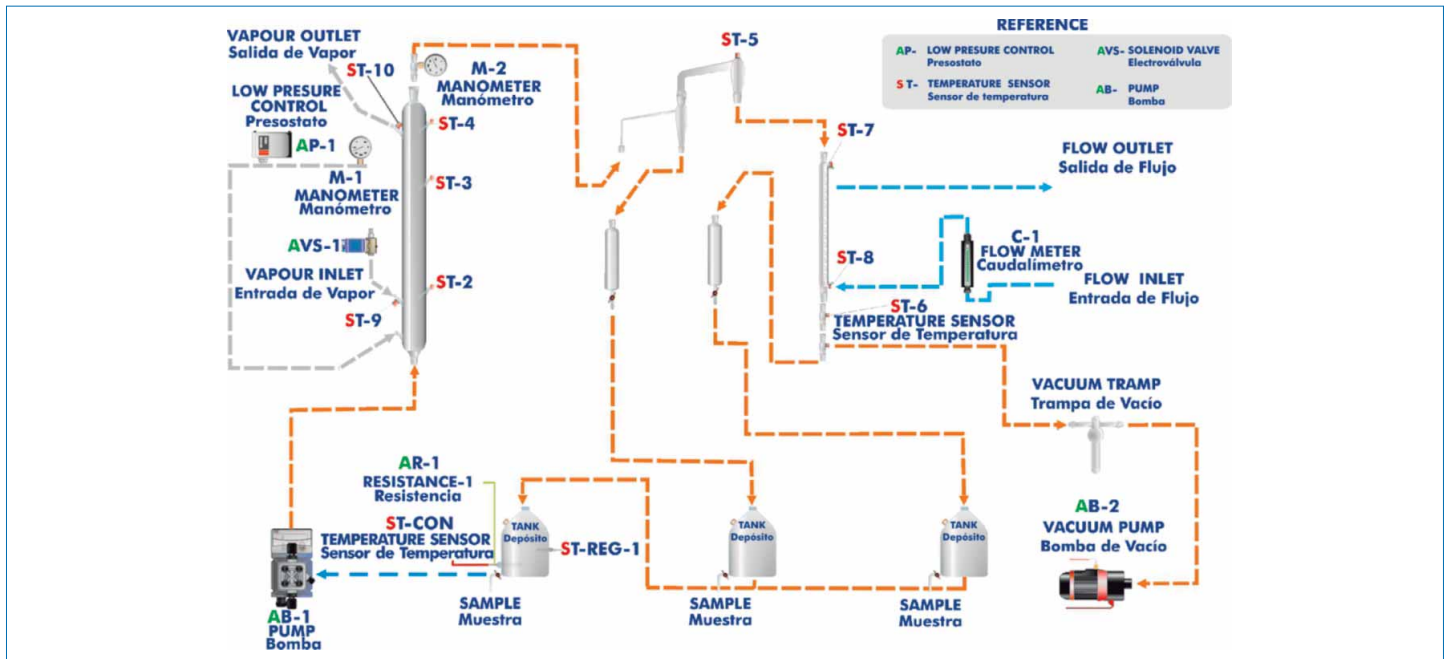


[www.edibon.com](http://www.edibon.com)  
 ↳ Products  
 ↳ Products range  
 ↳ Units  
 ↳ 11.-Chemical Engineering



Electronic console

## PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION



ISO 9000: Quality Management  
 (for Design, Manufacturing,  
 Commercialization and After-sales service)



European Union Certificate  
 (total safety)



Certificates ISO 14000 and  
 ECO-Management and Audit Scheme  
 (environmental management)



Worlddidac Quality Charter  
 Certificate  
 (Worlddidac Member)

## GENERAL DESCRIPTION

The objective of evaporation is to concentrate a non-volatile solute, carrying out the elimination of a volatile compound. Water is the volatile compound used in most evaporations.

The rising or falling film evaporators are very useful if high temperatures can degrade the product that we want to concentrate, so these evaporators work at less temperature. They can be used, for example, for concentration of fruit juices, milk and milk products, effluents, etc.

Basically, the unit consists of the following circuits:

**The feed circuit** that consists on a feed pump that introduces the product in a double jacket column, which has temperature sensors. The product leaves the tank through a cyclone placed at the output of the column and it is collected in a 500 ml graduated vessel. The vessel is also connected to a 10 l. tank for the storage of the concentrated product. This last tank is connected to the feed tank for its recirculation.

**The distillation circuit** starts at the top of the column, where a joint with a pressure meter has been assembled. It is also connected to the cyclone to separate the concentrated product and the distilled one that goes through a spiral condenser. The distilled product is stored in a graduated vessel that is connected to a 10 l. collection tank. This last one is connected to the feed tank for its recirculation in a continuous process.

**The steam circuit**, introduced in the external jacket of the column, contains a pressure meter for the control of the temperature of steam. This meter is connected to a high-pressure cutout control that opens or closes a control electrovalve for the steam supply.

**The vacuum circuit** consists on a vacuum pump; one trap placed at the output of the condenser and other trap placed at the output of the cyclone.

## SPECIFICATIONS

Anodized aluminium structure and panels in painted steel.

Main metallic elements in stainless steel.

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

Evaporation double jacket column, with a heating surface of 0.122 m<sup>2</sup>, 30 mm of internal diameter, 60 mm of external diameter and 1300 mm of length.

Membrane dosing pump, maximum flow 15 l./h, with flow control.

Single effect vacuum pump, maximum flow 3m<sup>3</sup>/h and maximum vacuum of 150 microns.

Three 10 l. tanks (for feeding, concentrated and evaporated).

Two 500 ml. graduated vessels for the storage of concentrated and evaporated product.

Coil coolant with length of 400 mm.

Heating resistance, range: 300 W.

Pressure safety cut out for pressure control in the column.

10 Temperature sensors, type "J".

1 Flow meter (0.2 to 2 l./min).

2 Manometers (0 to 2.5 bar).

Solenoid valve.

The unit incorporates wheels for its mobility.

Electronic console:

- Metallic box.

- Temperature sensors connections.

- Digital display for temperature sensors.

- Selector for temperature sensors.

- Pumps switches.

- Heating resistance switch.

- Heating resistance temperature control.

- Solenoid valve connection.

- Pressure safety cut out connection.

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.

Optional accessory (not included in the supply):

- EPDB. Falling Film Evaporator (for adding to EPAB).

## EXERCISES AND PRACTICAL POSSIBILITIES

- 1.- Determination of the capacity of the evaporator.
- 2.- Study of the capacity of the evaporator in function of the work conditions.
- 3.- Study of the relation between condensed product and evaporated product.
- 4.- Verification of the mass balance over all system.
- 5.- Study of the mass balance of the solute.
- 6.- Verification of the mass balance of the water.
- 7.- Determination of the concentration of a sugared solution.
- 8.- Calculate the enthalpy of the volatile vapours.
- 9.- Calculate the mass of steam is used by means of an energy balance calculation.
- 10.- Determination the economy of evaporator.
- 11.- Energy balance of the tubular condenser.
- 12.- Determination of the heat transfer global coefficient.
- 13.- Determination of the  $C_1$  coefficient for a tubular condenser.
- 14.- Investigation of effect of varying process parameters such as: vacuum, flow rate, temperature, recycle rate.
- 15.- Fruit juices and vegetable extracts concentration.
- 16.- Concentrated milk obtaining.
- 17.- Determination of the efficiency of the steam generator.

### REQUIRED SERVICES

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

### REQUIRED ACCESSORIES

- EDIBON Steam Generator (TGV), or similar steam generator.
- Stopwatch.

### OPTIONAL ACCESSORY

- EPDB. Falling Film Evaporator (for adding to EPAB).

### DIMENSIONS & WEIGHTS

#### EPAB:

- |                     |  |
|---------------------|--|
| Unit:               | -Dimensions: 1000 x 805 x 2300 mm. approx.<br>(39.37 x 31.69 x 90.55 inches approx.) |
|                     | -Weight: 115 Kg. approx.<br>(253.5 pounds approx.).                                  |
| Electronic console: | -Dimensions: 490 x 330 x 310 mm. approx.<br>(19.29 x 12.99 x 12.20 inches approx.).  |
|                     | -Weight: 10 Kg. approx.<br>(22 pounds approx.).                                      |

### AVAILABLE VERSIONS

#### Offered in this catalogue:

- EPAB. Rising Film Evaporator.

#### Offered in other catalogues:

- EPAC. Computer Controlled Rising Film Evaporator.
- ED PAC. Computer Controlled Double Effect Rising Film Evaporator.
- EDPAB. Double Effect Rising Film Evaporator.

\*Specifications subject to change without previous notice, due to the convenience of improvements of the product.



C/ Del Agua, 14. Polígono Industrial San José de Valderas.  
28918 LEGANÉS. (Madrid). SPAIN.  
Phone: 34-91-6199363 FAX: 34-91-6198647  
E-mail: edibon@edibon.com WEB site: [www.edibon.com](http://www.edibon.com)

Issue: ED01/13  
Date: July/2013

REPRESENTATIVE:

