

SINGLE-EFFECT EVAPORATOR WITH FALLING FILM



Experimental capabilities

- The concentration of a solution by evaporation
- Influence of operating conditions (flow rate, temperature ...)
- Heat and Mass balances, efficiency

Operating principle

The GPC V20 bench allows the study of single-effect evaporation.

A mixture of water and ethanol will be fed using a metering pump, into the vertical falling film evaporator. In this evaporator the mixture will be heated by a double jacket to allow the ethanol to evaporate. The liquid mixture then passes through a cyclone for the separation of the phases. The liquid phase is recovered in a receiver at the outlet of the cyclone, the vapor phase passes through a condenser and then is recovered in a receiver. The bench is also equipped with IT supervision using a touch pad with Didatec interface included.

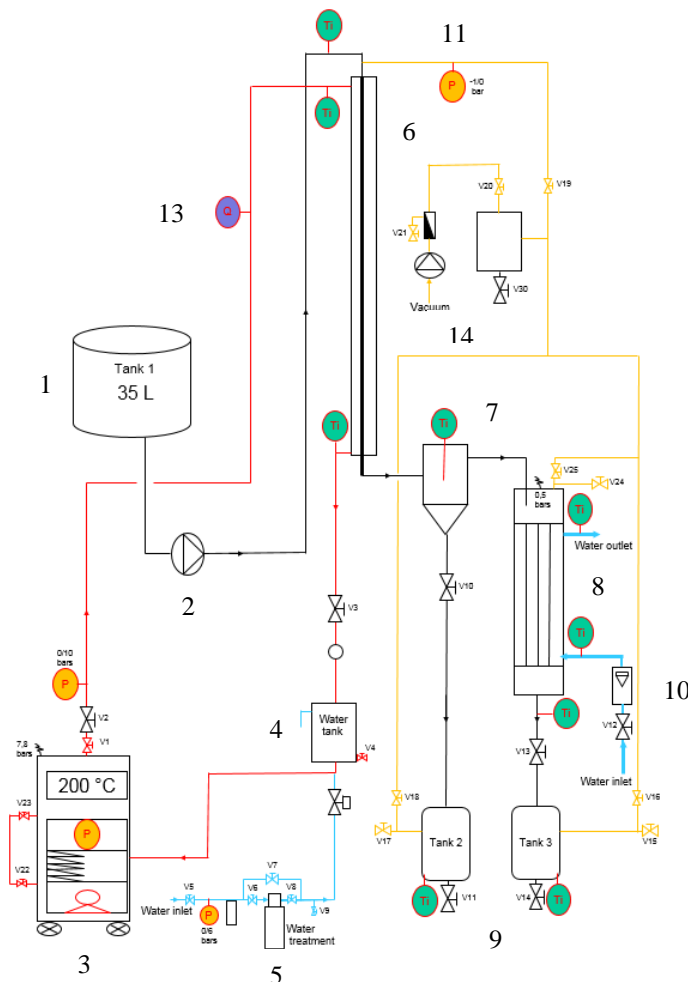
The robust design of this device makes it suitable for use in schools.

The equipment is set up on an Anodized aluminium frame on casters wheels. This gives it great strength and a flexibility of integration into your premises.

The manufacture of this equipment complies with the European standard for machinery manufacturing.

Illustrations

Technical details



1. Supply tank

- Polyethylene
- Volume : 35 L

2. Metering pump

- Variable flow rate 45L/h and 4 bars

3. Steam boiler

- Power adjust : 7kW-14kw-21kW
- Pressure : 7 bars

4. Water tank 45L

- Stainless steel

5. Water treatment 8L

6. Evaporator

- $S=0,12m^2$
- Double jacket
- Stainless steel

7. Cyclone

- Borosilicate glass

8. Condenser

- Borosilicate glass
- Stainless steel coil

9. Receivers tank

- Borosilicate glass
- Volume : 1 L

10. Digital flowmeter

- Scale : 0-10 L/min

11. Measurement of process temperatures

- Type Pt100

12. Measuring pressure

- Manometer -1/0 bar vacuum
- Manometer 0/10 bars (steam)

13. Steam flow rate with vortex flowmeter

- Scale : 80kg/h

14. Vacuum pump

GPC V20



Services required

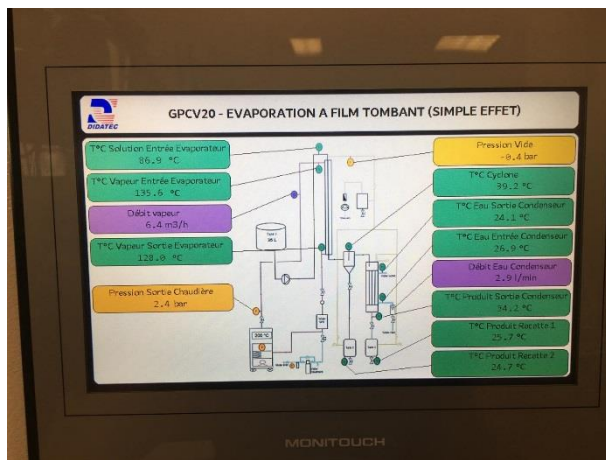
Documentation

- Electrical supply : 400 VAC – 50 Hz – 32 A
- Electrical network : 3 phases + Neutral + Earth
- Water supply : 15 L/min – 2 bars
- Water drain : on the floor
- Dimensions: (L x W x H mm): 2900 x 700 x 2900
- Weight (Kg): 260

- User's manual
- Pedagogical manual
- Technical documentation of the components
- Lab exercises
- Software
- Certificate of conformity CE

Note : if the equipment installation is operated by our staff, all supplies and exhaust connections required must stand at less than 2m from the machine

Included with the installation: Touch Pad of supervision



Display of the evolution of measures process

- T°C inlet steam evaporator
- T°C outlet steam evaporator
- T°C inlet solution evaporator
- T°C outlet solution evaporator
- Steam flow
- Steam pressure
- Vacuum pressure
- T°C Cyclone
- Network inlet water condenser
- Network output water condenser
- T°C tank 1
- T°C tank 2

Illustrations



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version : FT-GPCV20-STD-C

GPC V20

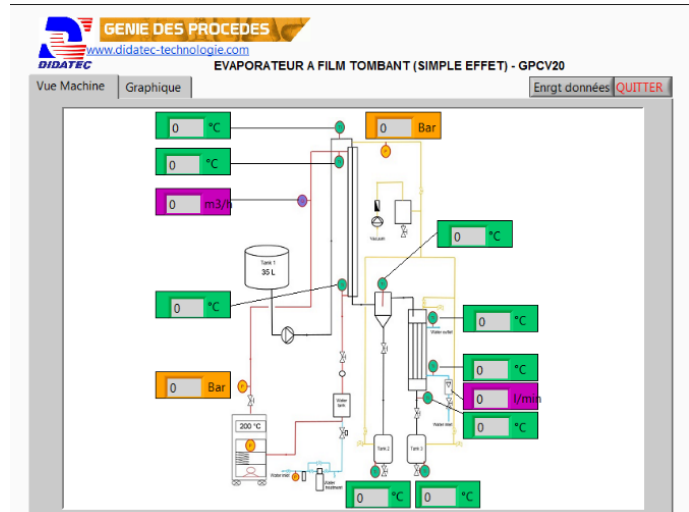


Supervision : Parameter setting, Plot of curve

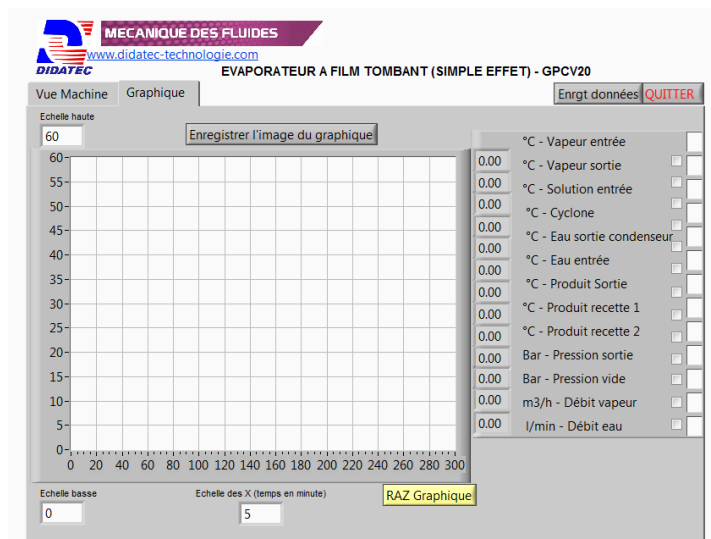
The bench is also equipped as standard with a monitoring and configuration software. The connection towards the PC is made via a standard USB port. The software is divided into two parts:

BLOCK DIAGRAM:

One finds in this window the block diagram of the machine with the location of various measures of the process and their values.



GRAPH:



Included in this graph window, the possibility of drawing the measurements curves as a function of time by selecting the desired quantities.