

## STUDY OF REACTOR



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### Experimental capabilities

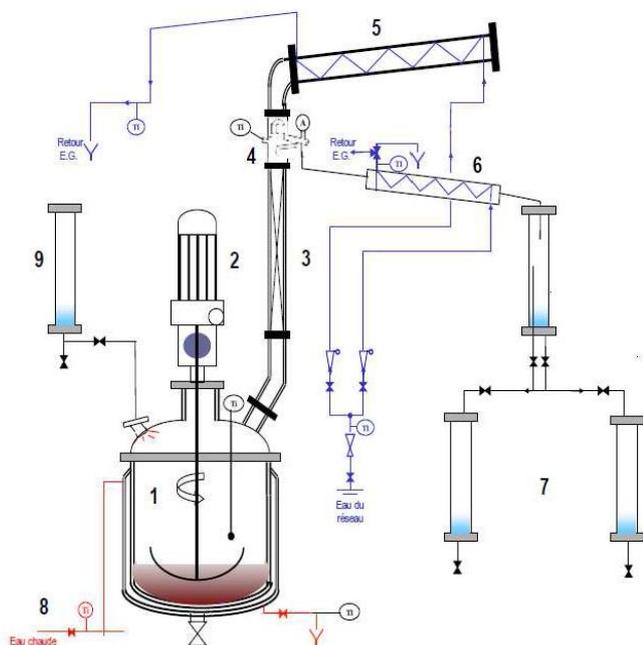
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- **Chemical reactor in liquid phase**
- **Batch type reactor**
- **Response time of chemical reagents**
- **Effect of residence time**
- **Effect of the temperature**
- **Agitation effect**
- **Solid liquid mixture**
- **Condensation**
- **Heat transfer**

## Operating principle

The GPCR05 bench allows the study of a semi-continuous reaction or in "batch" of esterification type. The reactor is connected to a rectification column which allows to recover or recycle the products and solvents of the reaction. The system is designed to allow the user to visualize the impact of the regulating parameters adjustments on the behavior (response) of the system. The robust design of this device makes it suitable for use in schools. The equipment is set up on an Anodized aluminum 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



### Electrical cabinet

- With the necessary elements for the proper functioning and safety of the equipment
- Emergency stop, 30 mA differential ...
- USB connection for computerized supervision

### Instrumentation

Ti: 2 temperature probes Pt100 with indicators (A probe in the reactor and another probe at the reflux head level)  
Digital flowmeter for measuring the flow rate of water in the condenser

## Spécifications techniques

### 1. Reactor

- Volume = 5L
- Borosilicate glass
- Double casing
- Heating by thermostat bath

### 2. Agitator

- Electric agitation 50-2500 rpm
- Shaft and propeller in stainless steel

### 3. Distillation column

- DN 50 mm
- Height = 300 mm
- Borosilicate glass
- Filling: Raschig rings

### 4. Electromagnetic reflux head

- Timer program with control from a PC
- Borosilicate glass

### 5. Condenser

- Stainless steel coil
- Borosilicate glass

### 6. Exchanger for distillate

- Borosilicate glass

### 7. Receivers

- Two receivers of 1L in borosilicate glass in order to recover the reaction phases
- Azeotropic decanter

### 8. Thermostatic bath to heat the reactor

- Volume = 5L
- Power = 2kW

### 9. Supply receiver

- Volume = 2L
- Borosilicate glass

## Services required

- Electrical supply : 230 Vac – 50 Hz – 20 A
- Electrical network : 1 phase + Neutral + Earth
- Water supply : 15 L/min – 3 bars
- Water drain : on the floor
- Dimensions: (L x W x H mm): 1300 x 440 x 1400
- weight (Kg): 90

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

## Documentation

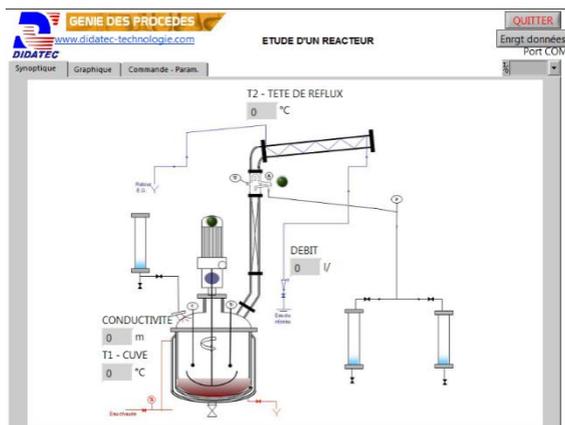
- User's manual
- Pedagogical manual
- Technical documentation of the components
- Lab exercises
- Software
- Certificate of conformity CE

## Software of supervision and remote control

The bench is also equipped with software of supervision and remote control. The connection to the PC is made by a standard USB port.

The supervision software is divided into three parts:

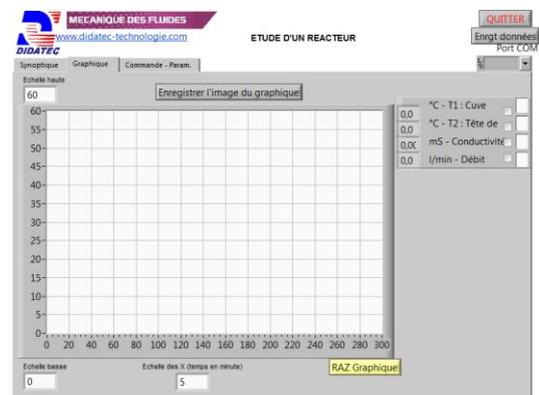
### BLOCK DIAGRAM:



We find in this window the block diagram of the machine with the location of various measures of temperature and their values.

### GRAPH:

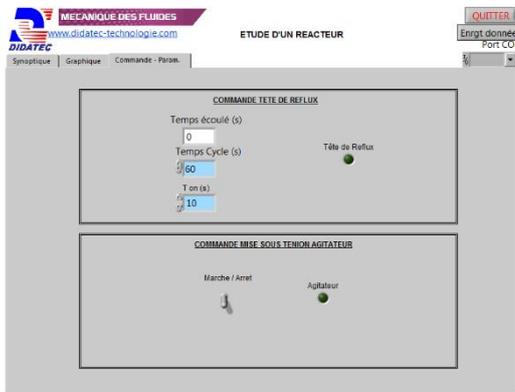
We find in this graph window, the possibility of drawing the measurement curves as a function of the time by selecting the desired quantities.



# GPCR05



## REMOTE CONTROL:



Included in this window, the ability to draw a curve with two parameters the temperature according to the entropy. The cycle is drawn in directly and changes according to the evolution of the turbine speed.

All these values can be recorded in an Excel file to allow further analysis.

This application can be installed on any computer (Windows XP, 7, 8 ...) and is free of any license.