

## PH CONTROL STUDY UNIT



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### Experimental capabilities

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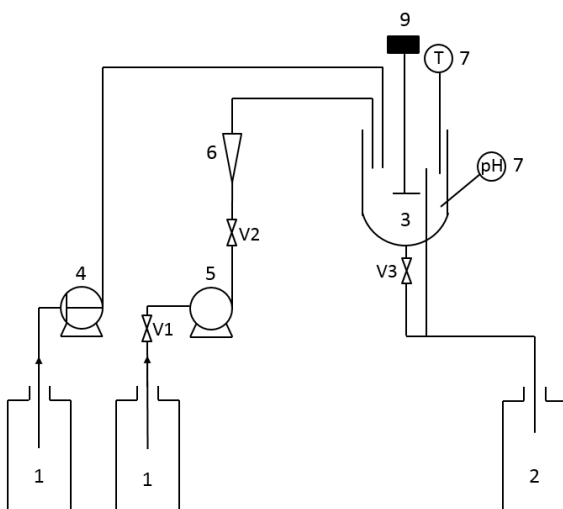
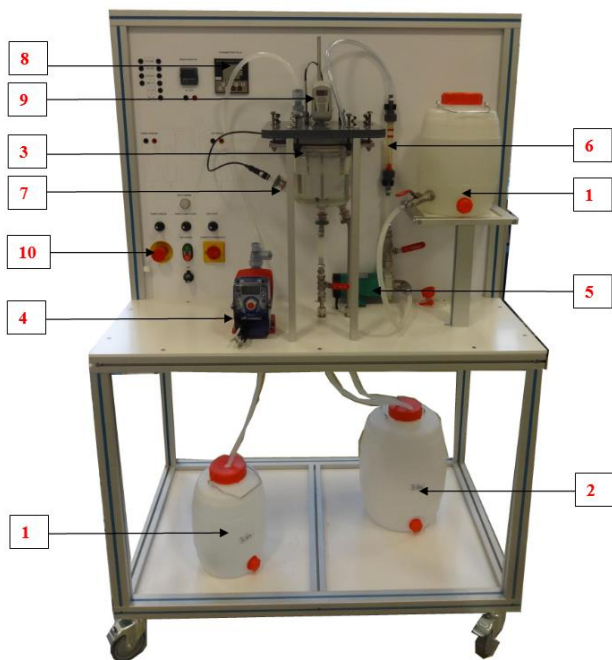
- Practical work on the components of a regulating loop
- Study of a pH regulating loop
- Technical data on the elements of a regulating loop
- Identification of the elements Sensor, regulator, actuator and disruptive element
- PID control parameters or autoadaptive
- Configuration of regulator
- Characteristic curves

## Operating principle

The RPH 050 bench allows the study of pH regulation. A centrifugal pump and a dosing pump provides basic and acid solution in the test reactor. A pH sensor measures continuously the value of pH in the reactor. In the reactor, a centrifugal pump is connected to additional the acid or the soda to create a disturbance. A digital PID controller receives pH information and must adjust the opening of the metering pump to achieve the setpoint. The homogenization of the solution is realized thanks to agitator with variable speed. The unit comes complete with instrumentation, technical and educational materials in english and all the accessories required for proper operation (Included the supervision software). The robust design of this equipment makes it perfectly suited for school use. Its anodized aluminum structure gives it great strength as well as great flexibility of integration into your premises. The manufacture of this equipment meets the European machine directive

## Illustrations

## Technical details



*Synoptic of pilot - RPH 050*

### 1- Two supply tanks (acid and sodium hydroxide)

- Volume: 10 L
- Materials : Polyethylene

### 2- Collecting tray in polyethylene

- Volume: 20 L
- Materials : Polyethylene

### 3- Reactor test (mix acid-sodium hydroxide)

- Volume : 5 L
- Materials : Glass borosilicate

### 4- Dosing pump of supply

- $Q_{max} = 12 \text{ L / h}$
- External control 4/20 mA (with regulator)

### 5- Centrifugal pump of supply

- Polypropylene body
- $Q_{maxi} = 570 \text{ L/h}$

### 6- Variable area flowmeters

- Scale : 0 to 15 L/h

### 7- pH measurement probe and temperature

- Scale pH :0 to 14
- Temperature : 0 to 100°C

### 8- pH transmitter 4/20 mA

- Display the measure in real time

### 9- Variable speed agitator

### 10- Monitoring software

- Control and monitoring of the process of regulation
- Representation of relevant data on PC
- Operation and setting of equipment regulator
- Recording and storage of developments in the time

### 11- Synoptic taking the pilot RPH 050

- Sensor and actuator signals are returned on the bushings of the diagram
- Two power supplies 24 VAC for two LEDs alarm
- A status indicator of the pump, bushings of inputs and outputs and of the indicator

## Services required

- Electricity : 230 VAC - 50 Hz - 16 A
- Water supply : 3 bars, 15 L/min
- Dimensions : (L x W x H mm) : 1100 x 530 x 1600
- Weight (Kg): 50

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

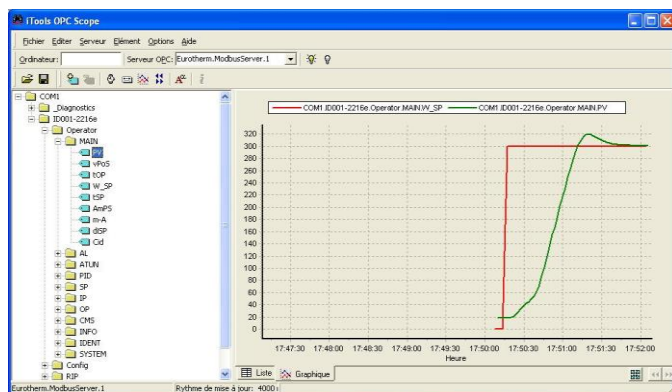
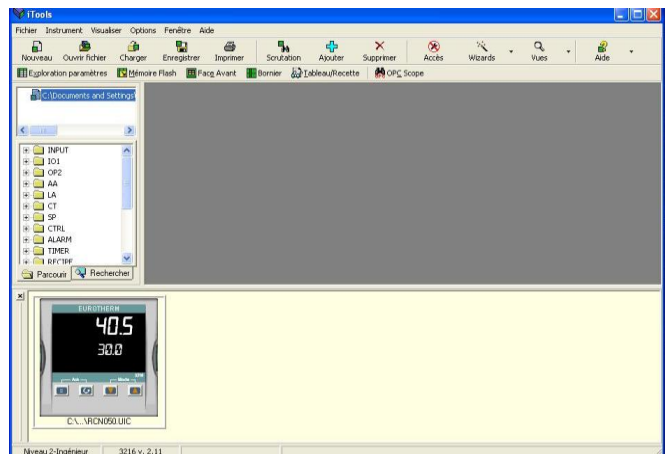
- User's manual
- Pedagogical manual
- Technical documentation of the components
- Lab exercises
- Monitoring software
- Certificate of conformity CE

## Setting, Supervision, Plotting curves,

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

### SETTING :

This section provides access to the regulator parameters directly via a data browser similar to that of Windows. The front panel of regulator is reproduced on the PC screen and the operator can actuate the buttons and controls as if he was on the pilot.



### Plotting the curves

This section allows you to draw curves with the signals of the regulator. For example on this image below we visualize the setpoint and the real-time measurement, but it is possible to add other parameters such as the output signal ... The data stored during the plot can then be saved in a file in Excel format.