

POLYVALENT REACTOR



Experimental capabilities

- Study of reaction kinetics
- Mixable batch reactor
- Liquid-liquid or liquid-solid mixture
- Evaporation-Distillation-Concentration-Settling-Crystallization
- Heteroazeotropic settling
- Study of the reaction medium: physical and chemical parameters
- Study of heat transfers
- Material balances

Operating principle

The GPCR10 trainer allows the study of a semi-continuous or "batch" reaction of the esterification type. The unit is made up of a single module. The reactor is connected to a rectification column which makes it possible to recover or recycle the products and solvents of the reaction.

The system is designed to allow the user to view the impact of control parameter settings on the behavior (response) of the system. The installation can operate at atmospheric pressure or under vacuum.

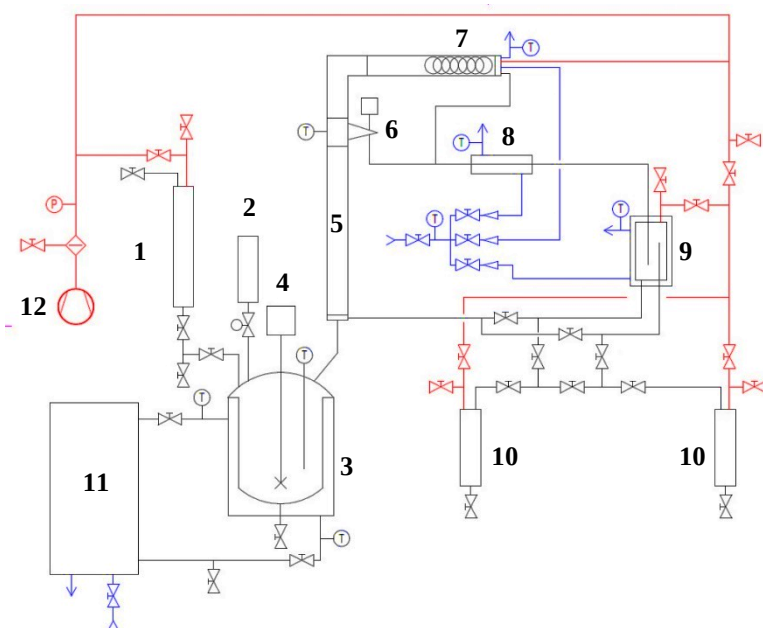
The rugged design of this equipment makes it ideally suited for use in schools.

Its anodized aluminum structure on multidirectional casters with brakes 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



1. Food recipe "ampoule of glass casting"

- Volume = 3 L graduated
- Borosilicate glass with filling by rising juice using the vacuum pump

2. Food recipe "solid reagents"

- Powder incorporation
- Borosilicate glass

3. 316L stainless steel reactor

- Volume = 10L
- Glass cover with 6 nozzles
- Double casing in stainless steel

4. Variable speed agitator

- Electric stirring
- Shaft and blade in 316L stainless steel

5. Distillation column

- DN 50 mm
- Height = 600 mm
- Borosilicate glass
- Filling: Rashig

6. Electromagnetic reflux head

- Automatic valve with adjustment
- Timer program from the touch screen
- Borosilicate glass

7. Glass condenser

- Stainless steel coil

8. Refrigerant for the distillate

- Borosilicate glass

9. Azeotropic decanter

- Allows to recover the light or heavy phase of the distillation
- Double glass envelope

10. Two glass graduated recipes

- Two graduated recipes of 2L

11. Temperature control unit (OPTIONAL)

- Power 9kW

12. Vacuum pump

Vacuum circuit

Vacuum trap, juice lift connection, adjustment valve, pressure sensor -1/0 bar. Work also possible at atmospheric pressure.

Electrical cabinet

- With the elements necessary for the proper functioning and safety of the equipment
- Mushroom stop, differential 30 mA ...
- 7 " supervision screen with synoptic, actuator controls, real-time measurements

Instrumentation

- 8 Pt 100 temperature probes displayed on the supervision screen (a probe in the reactor, reflux head, inlet and outlet condenser, refrigerant inlet and outlet and decanter, temperature control unit circuit inlet and outlet)
- Stirring speed measurement
- Digital flow meters to measure the flow of water in the condenser, distillate refrigerant and settling tank

Services required

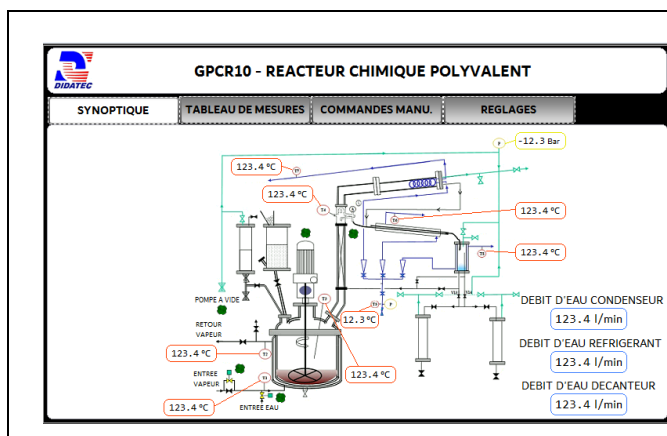
Documentation

- Electrical supply: 400 Vac – 50 Hz –32 A
- Electrical network: 3 phase(s) + Neutral + Earth.
- Heating: pressurized water thermoregulator (not included)
- Water supply : 15 L/min – 3 bars
- Water drain : on the floor
- Dimensions: (LxWxH mm): 2500 x 800 x 2500
- weight (Kg): 300

- User's manual
- Technical documentation of the components
- Lab exercises
- Wiring diagram
- Fluidic diagram
- Supervision touch screen
- 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: Supervision touch screen



Control of the various actuators and display of the evolution of process measurements:

- T1: reactor inlet temperature
- T2: reactor outlet temperature
- T3: reactor temperature
- T4: reflux head temperature
- T5: heat exchanger water inlet temperature
- T6: refrigerant water outlet temperature
- T4: condenser water outlet temperature
- T5: decanter water outlet temperature
- Water flow measurement
- Vacuum circuit pressure measurement

Supervision: Parameter, Curve plot

The bench is also originally equipped with supervision and configuration software. The connection to the PC is made via WIFI. The software is divided into three parts:

SYNOPTIC:

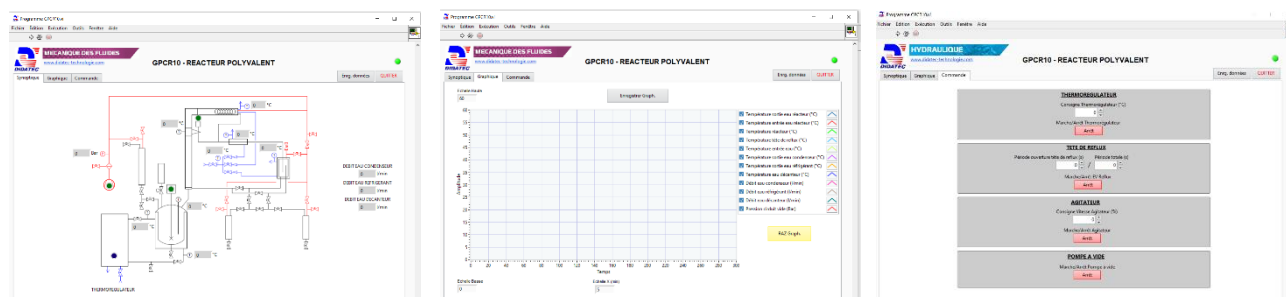
Synoptic of the machine with the location of the various process measurements and their values.

GRAPHIC:

graphic window with the possibility of plotting measurement curves as a function of time by selecting the desired quantities.

CONTROL:

Control of the actuators of the bench: agitator speed, cycle of the reflux head, vacuum pump, thermoregulator.



GPCR10



OPTION

- GPC R11 Temperature control unit:

- Power 9kW

