The system is configured to enable supercritical carbon dioxide (SCCO2) extraction using 100 to 400 L extraction vessel(s) in a single or dual configuration rated for operation up to 600 bar and 80°C. The system includes either one or two separator vessels, a pneumatic CO2 pump and a co-solvent pump, and all associated valves and pipings. The system is mounted on a stainless steel frame.

Solids can be processed simultaneously or alternatively, the devices can work in serie or in parallel. In the alternative functioning, one autoclave is in extraction phase while the other is either in decompression phase or in load change phase with basket replacement, or in compression phase. In the serie functioning, the device with the most depleted load is put ahead. With the parallel functioning, the device can deal simultaneously with the two autoclaves with reduced flows in order to treat finely pound loads, witch increases the extraction speed.

The supercritical solvent is entirely recycled after the solvent/extract separation.

**DESIGN FEATURES:**

**Autoclave:**
- Autoclave extraction batch: 100, 200, 300 or 400L autoclave with its extraction basket.
  - Available in single or dual configuration
- Separators: 30L separators able to work at pressures of 100 and 300 bars. Available in single or dual configuration
- Liquid CO2 reservoir: with a volume of 600 mL, it is used to stock the CO2 during its recycling after the separators, and to collect the depressurized CO2 at the end of the extraction. It is equipped with a level sensor

**Pumps:**
- CO2 pump: triplex batcher pomp URACA with double shell delivering liquid CO2 from 300 to 1000 kg/h at 600 bars. The flow is set by the motor pump frequency change. The flow is measured by a mass flow controller at Coriolis effect
- Co-solvent pump: batcher pump with a variable flow from 20 to 100 L/h

**Heat exchanger:**
- Condenser: the condenser is put on the CO2 recycling line after the separators. The liquefied CO2 is then stocked before being re-pomped. It is cooled by glycoled water at 0°C produced by the water production group
- Re-heater at the pomp end to pre-heat the extracted CO2 mix before separation. It allows to fix the solvent temperature before its coming into the extraction autoclave at the wished value (0 to 70°C)
- Evaporator installed before the separators. A supplementary re-heater is put between the two separators

**Instruments and valves:**
- Unit equiped with all needed valves and instruments: pressure and temperature sensors, flow controller...
- Necessary safety equipments: pressure switch, thermostat, safety valves...

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**OPERATION:**
This unit is entirely automatized through a computer ensuring the unit launch, the managing, the safety monitoring and alarms management, the programmed or on-alarm stop.
For compulsory safety reasons and to optimize the production, it is necessary to provide a command and control system managing all the extraction operations. Top Industrie will develop this automation.
A remote control provide advice and maintenance far from the unit.

Autoclave size and equipments are taylor-made according to your needs and technical requirements.

**Main standard systems are:**
- **SFPU:**
  - Two extractors: 200 L each, service pressure 600 bar, service temperature 20 to 70°C
  - Two separators: 30 L each, service pressure 300 bar (1st floor), 100 bar (2nd floor), temperature pressure 20 to 70°C
  - CO2 pump: 300 to 100 kg/h at 600 bars
  - CO2 tank: 600 bar, service temperature 0 to 15°C
  - Condenser, pre-heater and evaporator
  - Command & control system

PID of our industrial unit in Tunisia

Our industrial unit in Tunisia

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