

Supercritical Fluid Extraction System

DESIGN

- A trolley carrying main parts of the system: extractor, separators, heat exchangers, as well as sensors and safety elements.
- Control panel is located in a separate compartment isolated from fluidics part.

SAFETY

- All heated zones are equipped with temperature safety switches
- Pressure safety valves calibrated to max permitted pressure
- Isolation needle valve

CONTROL

- 4 temperature control zones (independent inputs/outputs)
- 1 temperature measuring zone
- 3 pressure indicator zones
- 2 manual pressure controllers



BENEFITS

- Extracts do not contain solvent residues.
- Mild conditions prevent valuable substance destruction.
- Supercritical CO₂ is fully recyclable solvent.
- Product concentration does not require evaporation step
- No hazardous solvent wastes
- Pressure control provides additional dimension of selectivity
- Perfect penetration of the supercritical fluid into material pores improves the process

Technical Data

REACTOR	
Volume, ml	1000
Geometry (DxH), mm	65x314
Insert	Cylinder, with filter support
Adapters	Optional 250 or 500 ml
Temperature range °C	30 ... 150
Pressure control	Manual
Maximum pressure	400 bar
CO₂ PUMP	
Drive	Compressed air, pressure range 0.2-10 bar
Amplification ratio	60
Maximum pressure	600 bar
Cycle volume, ml	11
Head cooling	Spiral, fed from external cooler
Liquid CO ₂ feed	Cylinder with immersed pipe, Ca. 55 bar
SEPARATOR, DUAL STAGE	
Vessel volume, ml	500
Maximum pressure, bar	200
Pressure control	Manual, after 1 st stage
Max temperature °C	100
COSOLVENT PUMP	
Maximum pressure, psi	10000
Maximum flowrate, ml/min	10
Constant pressure mode accuracy	±2% @ 5 ml/min
COOLER	
Vessel volume, l	18
Temperature range/accuracy °C/K	-5-20/2
Maximum flowrate (pressure) l/min (bar)	42 (3.4)
Cooling power	4 kW
WETTED MATERIALS	SS316 and CO ₂ fluid resistant polymers

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- CO2 circulation mode is provided by the set of valves and heat exchanger
- CO2 flowrate derived from a table as function of pump pressure and cycle frequency
- The set of heat exchangers for cooling the flow (before the pump) and heating it (before the reactor)
- The set of safety valves venting reactor and separators in case pressure exceeds maximum allowed.



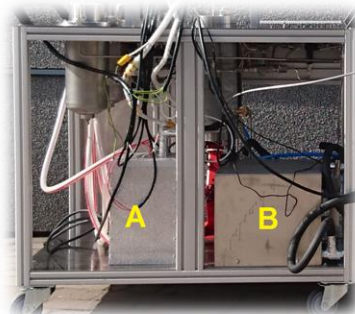
Electronics control panel



CO2 pump (A); reactor top flange (B); Separator vessels (C,D); manual pressure controls (reactor, E, separator (F)



Insert with spring retainers and filter holder plates



Rear view showing heat exchangers. A – heating before reactor; B – cooling before CO2 pump.



Front view showing the system with Lauda cooler

INSTALLATION requirements

- Ventilated room
- Ventilation port, at least 50 mm
- Power 1 x 380V/3 phase; 2x220V/1 phase
- CO2 Cylinder
- Compressor, 10 bar, at least 300 l/min, including dryer, oil and dust filters



Fluidic control panel with valves for system filling, venting the vessels, recycling, pump pressure control