Equipment Name: Pressure Vessel of 300 bar

Pressure Vessel for sCO2

The pressure vessel is expected to store liquid CO2 at a maximum pressure of 300 bar and at a minimum temperature of 5^0 C. The purpose of this vessel is expected to act a **phase separator** to be able to supply liquid CO2 to the downstream pump. it can expect a maximum withdrawal liquid flowrate of 0.2kg/s while there might be a 30% volume fraction of uncondensed vapour of CO2 might exist in the feed line. The unit is intended to supply only liquid CO2 to the downstream high pressure pump while the input to the unit is coming from a condenser. The output line shall be from the bottom of the vessel. The unit is expected to have a rupture disc for burst protection and a self-regulating valve for maintaining the pressure within 200bar. It should have the provision for venting CO2 out during the restart operation for depressurizing the system. The unit shall have digital level sensor whose output should be monitored through the system. The vessel should also have the pressure and temperature sensors embedded in it whose output also must be data logged. The vessel should have proper insulation to minimize the losses to ambient. The maximum ambient temperature expected is 42^0 C. The make shall be of SS316L material complying with ASME codes of standard pressure vessel manufacturing.

System Requirements

Parameter	
Pressure	300 bar
Temperature	Min of 5 deg C
Equipment Make	SS316 L
Pressure Sensor	In-built range 300 bar
Rupture disc	300 bar capacity
Temperature	RTD $\pm$ 0.1 deg C accuracy
Liquid Level	Digital with RS232/485 connection
Self-Regulating Valve	Made of SS316L body for maximum of 300 bar pressure
Vapour volume	Maximum 30% of the liquid volume
Total Vessel Capacity	To be designed as a phase separator by Vendor
Inlet Feed line	1” inch BSP (above the liquid level)
Output Line	1” inch BSP (from the bottom)
Drain Line	1” inch BSP
Insulation	Outer walls to be covered to maintain temperature 5 deg C
Sight Glass	No
Wall Thickness	Meeting ASME codes
Liquid	15 mins

Residence Time	
Withdrawal liquid rate	0.2 kg/s
Fluid Properties	Use Refprop of NIST database (https://www.nist.gov/srd/refprop)

Electrical Requirement

Voltage	220 to 240 V
Current	15 amps / 3 Phase supply

General Conditions:

1. List of Purchase orders or supply references to institute of National importance, PSU, or premier research institutes to be attached.
2. Quotation for 2 years standard warranty + 1 year optional warranty.
3. Should provide list of spares and their cost.
4. Must provide pressure test certificates, factory acceptance test (with co2) and provide the test report for the items.