CORRIGENUDM – 1

Department of Aerospace Engineering

Extension of bid submission date:

The due date for the submission of bids has been extended to 11/03/2021 @ 3 PM & the technical bid opening is 11/03/2021 @ 4 PM.

Changes in technical specification:

High Pressure sCO2 Pump

The pump is expected to deliver super critical CO2 at a pressure of 200 bar with **no** pulsation in the flow. The expected maximum mass flow outlet from the pump is 0.05 kg/s at a maximum discharge pressure of 200 bar. The pump should have the in-built cooling system to protect from overheating issues. The pump needs to have full protections against burst protection with appropriate burst protection disc and pressure regulating valves. The motor associated with the pump needs to be electrically driven with the capacity of up to 30 KW rating. The electrical motor shall have a small fan to electrically cool it. The pump should have noise levels less than 60 DB, if exceeds, the system needs to have an appropriate noise protection cabinet. The pump shall have required protection for handling back pressures and Cavitation. The inlet and exit ports of the pump shall meet the standard BSP norms. The pump shall be quoted along with the **back-pressure regulator** to regulate the feed pressure to the pump. The pump shall be associated with adequate control systems to be built as auxiliary units and shall be quoted along with the quotation. The expectation is to deliver the flow at a given set point flow and discharge pressure without any flow fluctuations using Feedback loop control system that uses PID controller along with the Coriolis flow meter. The motor VFD unit should be coupled with the PID controller as well to control the flow appropriately. The motor shall be controlled from the location outside the lab through a personal computer. Hence the final system shall encompass required software interface to be used from a lab PC.

Detailed technical specifications for the requirements are listed below.

Operational Specifications

S.No.	Description	
1.	Mass flow	0 – 0.05 kg/s or 0 to 180 kg/h
2.	Discharge Pressure	Max 200 bar
3.	Discharge Temp (C)	70 degree C
4.	Power Rating	30 KW
5.	Operating Mode	Set Pressure and Mass Flow Control Modes
6.	Control System	Yes. Include accessories for a

		fully automated PID control system to achieve steady mass flow at a set pressure
7.	Pump Cooling	In built lubricant cooling system
8.	Electrical Motor	30 KW
9.	Electrical Motor Cooling Fan	2 HP blower fan for cooling the motor
10.	Inlet Pressure	Up to 60 bar
11.	Communication	RS232/RS485
12.	Mode of Operation	Continuous & Closed Loop System
13.	VFD	Suitable for CO2 pump at the specified power rating of 30 KW
14.	Fluid Condition at the Pump Inlet	Liquid CO2 at 10^0 C and 50 to 60 bar pressure
15.	Back Pressure Regulation Valve	Rated up to 400 bar
16.	Pump Base Frame	Made of Mild Steel
17.	Motor to Pump Shaft Coupling	Yes
18.	Burst Protection Disc (Explosion protection)	Yes
19.	Pulsation Damper	Yes
20.	Controller (Mass flow and Discharge pressure based set point)	PID controller unit for feed back from the flow meter to the VFD of the motor
21.	Software Interface	Software to be installed in the PC to control the pump
22.	Back pressure regulator	One unit at the inlet of the pump to regulate the back pressure with range of 300 bar

Electrical Specifications

S.No.	**Description**	
1.	Voltage	3 Phase – 220- 240 V
2.	Power	Up to 30 KW
3.	Current	10 - 15 A
4.	Frequency	50 – 60 Hz