


Supply Installation Commissioning of High Pressure High
Temperature Stirred Vessel Reactor

Tender ID 2022_CSIR_174462_1 Dtd 14.11.2023
PUR/ICT/DMS/567/23-24

Sub: Extension of Bid submission Date

The last date for submission of Bid is being extended up to **20.12.2023 (1300 Hrs)** and the Date of opening is **21.12.2023 (1430 Hrs)**

Bidders may take note of the amendment and submit their bids accordingly.

 5.12.2023

(Dharmendra Kumar)
Controller of Stores and Purchase

Minutes of Pre-Bid Conference (PBC) held on 23-11-2023 for proposed procurement of “Supply, Installation and commissioning of High Temperature Stirred Vessel Reactor”

Chairpersons / Members of the Technical Sub Committee (TSC) present during PBC including domain experts:-

1. Dr N.Lingaiah, Chairman
2. Dr. Pratyay Basak, Member
3. Dr. G. Jithender Reddy, Member
4. Dr. Sreepriya Vedantam, Member
5. Shri D.Venkateshwar Rao, Member
6. IO – Dr. P.Anand

Representatives of the following firm attended the PBC:

1. M/s Amar Equipment Private Limited
2. M/s NSC Industries Private Limited
3. M/s Nano-Mag Technologies Private Limited

The following points were discussed during the PBC:

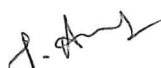
Query raised by M/s. Amar Equipment Private Limited, and response of CSIR-IICT:

Query-1: **Serial No. 8 of 5L & 10L Autoclaves:** specified Heating control accuracy should be changed *from* $\pm 0.01^{\circ}\text{C}$ *to* $\pm 0.1^{\circ}\text{C}$.

Response: *Change of Temperature control accuracy from $\pm 0.01^{\circ}\text{C}$ to $\pm 1^{\circ}\text{C}$ is acceptable.*

Query-2: **Serial No. 19 (II):** Instead of two different Pressure Gauges (Positive and negative pressure) only one should installed due to lack of space on the lid.

Response: *Installation of single pressure gauge is absolutely fine, however the indication and control of vacuum must be provided inside the process equipment (Mechanically & Electronically).*



Query-2: **Serial No. 19 (IV & V):** Pressure Relief Valve & Pressure Safety Valve have similar functions, hence only one of them should be installed in the autoclave.

Response: *Only one PRV with a set pressure of 120 Bar, will be installed on the Reactors. However proper particulate filter(s) for fluid (both gas & liquid) should be provided before the PRV, to protect it from corrosion and clogging of spring of the PRV. Furthermore, an additional Rapture disc with a set pressure of 150bar (designed pressure) must be installed in the process equipment.*

Query-3: **Serial No. 19 (VIII):** MFC should be in pressure control mode.

Response: *The MFCs has common feature to set as either process control or pressure control. Hence MFC with pressure control is acceptable.*

Query-4: **Serial No. 19 (IX):** Instead of two additional inlet lines, only one inlet lines should be provided without Flow Control Valve.

Response: *This condition is acceptable.*

Query-5: **Serial No. 19 (XII):** 0.1 ml/minute flow rate is only possible in HPLC pumps which is suitable for liquid but not slurry. Whereas the metering Pump is suitable for slurry but cannot maintain the 0.1ml/min accuracy. Hence the fluid inlet pump should be HPLC pump only.

Response: *This condition is acceptable.*

Query-6: **Delivery:** Delivery should be minimum 12-14 weeks

Response: *The committee decided to extend the delivery period up to 12 weeks.*

Query raised by M/s. NSC Industries Private Limited, and response of CSIR-IICT:

Query-1: **Serial No. 17 of 5L & 10L Autoclaves:** TEMA Standards should not be mandatory for Heat Exchangers.

Response: *The standard for Heat Exchangers should be as TEMA or equivalent with proper design data.*

P. A. S.

Query-2: **Serial no. 19(VII):** Flow Indicator & Totalizer will be enclosed by the ATEX/PESO certification Flame proof Control Panel, hence no need for ATEX/PESO certification individually.

Response: *This condition is acceptable.*

Query-3: **Serial No. 20:** NEMA certification for the electrical enclosure may not be required as it's certified by PESO/ ATEX.

Response: *The electrical enclosure of NEMA 4X, NEC/ANSI certifications not mandatory.*

Query-4: **Serial No. 21:** Spares should be included in the total price of Reactor or quoted extra?

Response: *The committee suggested to include the all accessories and spares price in the Bid only.*

Query-4: **Delivery:** Delivery of the equipment should be minimum 14-16 weeks

Response: *The committee decided to extend the delivery period up to 12 weeks.*

Query raised by M/s. Nao-Mag Technologies Private Limited, and response of CSIR-IICT:

Query-1: **Serial No. 8 of 5L & 10L Autoclaves** Heating control accuracy is difficult to achieve.

Response: *Temperature control accuracy changed from $\pm 0.01^{\circ}\text{C}$ to $\pm 1^{\circ}\text{C}$*

R. A. S.

Points clarified by CSIR-IICT Team during PBC:

The firm informed that they do not have problem with other points of tendered specifications and requirements. Participating bidders have been informed that points raised by them during PBC will be examined by CSIR-IICT's **Technical Sub Committee (TSC)** constituted for the purpose of procurement of said equipment and **post PBC changes** in tendered specifications and requirements to be agreed after due consideration of the same by TSC, if any, will be uploaded in **CPPP** as part of **revised/amended tendered specifications**.

Minutes of the PBC with changes agreed (if any) will be uploaded in due course at **CPPP** for information and reference of prospective bidders on or before **29.11.2023**. All bidders are requested kindly to take a note of changes in tendered specifications subsequent to PBC held today, i.e. 23-11-2023 before they start submitting their online bids through **CPPP**.

(Dr. Pratyay Basak)

Member


(Dr G. Jithender Reddy)


Member


(Dr Sreepriya Vedantam)


Member


(D. Venkateshwar Rao)

Member


(Dr. P. Anand)

IO


(Dr. N. Lingaiah) 4/12/2023

Chairperson



Revised Specifications/Corrigendum

File Ref. No. PUR/IICT/DMS/567/23-24

Date: 23.11.2023

Serial No. 8 of 5L & 10L Autoclaves: *Heating arrangement:*

Ceramic Band Heater with Ex-Proof / Flame Proof Gas (Hydrogen) Group IIC Zone 1[ATEX / PESO (Petroleum and Explosives Safety Organization, India) or equivalent] certified, Junction Box along with cladding, insulation and Cascade Temperature Controller for Precise Temperature Control of Designed Temperature Range with an Accuracy of $\pm 1^{\circ}\text{C}$ should be provided.

Serial No. 17 of 5L & 10L Autoclaves: *Reflux condenser & H.E.(s) with distillate collection pot:*

- I. 0.02m² *Reflux Condenser* with isolation & vent valves for reflux of the reaction vapor, which should withstand the designed ranges of Temperature & Pressure should be provided. (MOC= Hastelloy C-276).The Condenser should be designed as per TEMA Class-B (Tubular Exchanger Manufacturers Association standards for chemical service process) Standards *or equivalent with proper design data.*
- II. 0.2m² *Shell & Tube (Reverse Flow) Heat Exchanger(s)* with isolation & vent valves should be provided, for distillation, which should withstand the designed ranges of Temperature & Pressure. (MOC= Hastelloy C-276).The Heat Exchangers should be designed as per TEMA Class-B (Tubular Exchanger Manufacturers Association standards for chemical service process) Standards *or equivalent with proper design data.*

Serial No. 19 (II): *Pressure Gauge (1 No.):*

Ex-Proof / Flame Proof, Gas (Hydrogen) Group IIC Zone 1[ATEX / PESO (Petroleum and Explosives Safety Organization, India) or equivalent] certified, Vacuum Protected *Analog Pressure Gauge* with suitable end connections should be provided. Nominal Size-4 inch, Scale Ranges: (0-200 bar), MOC= Hastelloy C-276 (all wetted parts). *However the indication and control of vacuum (both Mechanical & Electronics), must be provided inside the process equipment*

Serial No. 19 (IV & V): *Pressure Relief Valve (PRV)*

- I. *Pressure Relief Valve Pilot Operated (Balanced Type)* along with suitable end connections must be provided on the lid of the Reactors. It must be compatible with slurry, vapour & gas media within the at 120bar pressure. The electrical parts of the above item should be ex-proof, if any.



- II. A suitable Rapture Disc must be provided at maximum designed pressure of 150bar on the Reactor.

Serial No. 19 (VII): *Flow Indicator & Totalizer:*

A suitable Flow Indicator & Totalizer for charging of liquid & gas into the reactor must be provided. It should be programmable with alarm, compatible with PLC/DCS/SCADA/ MATLAB, Simulink, LabVIEW etc. and should have LED/LCD daylight bright display.

Serial No. 19 (VIII): Provisions of HC-276 gas inlet lines with proper end connections for TWO different, Ex-Proof Thermal Gas *Mass Flow Controllers* (MFC) (Preferably BRONKHOST Make or its equivalent) must be provided at the gas inlet:

- A. Type: Multi gas (Nitrogen, Oxygen & Hydrogen, Helium, Argon), Flow range: 0.4-20 slpm, Inlet pressure : 120 Bar & Outlet pressure: 103 Bar, MOC = SS316L, O-ring: EPDM/Viton
- B. Type: Single gas (Ammonia), Flow range: 0.4-20 slpm, Inlet pressure: 10 Bar & Outlet pressure: 8 Bar, MOC = SS316L, O-ring: EPDM/Viton.

The MFCs should be compatible for either in Pressure Control mode or Flow Control Mode.

Serial No. 19 (IX): TWO different *Inlet Lines* should be provided for charging of fluid into the Reactor. Such as:

- A. First / Direct Line with suitable In-Line Gas Particulate Filter, Flow Control Valve and Non-Returnable Valve passing through MFCs should be provided, MOC = Hastelloy C-276 (all wetted parts)
- B. Alternate / bypass inlet line with suitable In-Line Gas Particulate Filter, Flow Control Valve and Non-Returnable Valve passing through *Flow Indicator & Totalizer* should be provided. MOC = Hastelloy C-276 (all wetted parts).

ONE Spare inlet lines with suitable Non-Returnable Valve (NRV) & other end connections should be provided. MOC = Hastelloy C-276 (all wetted parts).

Serial No. 19 (XII): *HPLC Pump:*

Ex-Proof / Flame Proof, Gas (Hydrogen) Group IIC Zone 1 [ATEX / PESO (Petroleum and Explosives Safety Organization, India) or equivalent] certified, *HPLC pump*, compactable to pump corrosive liquid, must be installed besides the autoclave. MOC=Hastelloy C-276, pressure 1-120 bar, flow range: 0.1-50ml/minute with digital controller (precise flow control) and provisions for data logging.

P.A.

Serial No. 20: Process Automation:

Ex-Proof / Flame Proof, Gas (Hydrogen) Group IIC Zone 1[ATEX / PESO (Petroleum and Explosives Safety Organization, India) or equivalent] certified control panel, integrated with these following:

Serial No. 20-ii (f): Spare modules for:

- ❖ Data logging and process control through HMI and PC installed with PLC/DCS/SCADA/ MATLAB, Simulink, LabVIEW etc. (Protocol MODBUS/PROFIBUS with RS-485, Ethernet, RS-485 to USB converter, LAN, IoT etc.)
- ❖ Data acquisition and control
- ❖ Record and transfer of process data through USB
- ❖ HMI+PC dual control
- ❖ Multi-channel measuring control
- ❖ Data logging through networking and wireless (IoT)

Serial No. 20-iii: Programmable Logic Controller (PLC):

Modular type PLC along with Redundancy Control Architecture or better control system must be provided. It should integrate 30 different modules (both analog & digital), with IoT & wireless modules etc.

Automatic control for process pressure & temperature with Ramp & Soak Control (16 steps programming).

Delivery: 12 weeks.


All the other tender terms remains unchanged. Bidders may please submit their bids accordingly.


(Dr. Pratyay Basak)
Member


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Member


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