

Government of India
Bhabha Atomic Research Centre
Laser & Plasma Technology Division

Trombay, Mumbai-85.

Date: 21/01/2022

REF: LPTD/Works/YC/22/28752

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To

Sub: Inviting quotation for fabrication

Dear Sirs,

1. Quotations are invited for **Relocation, Re-Installation and Re-Commissioning of Tungsten Vacuum Furnace as per specifications attached**
2. Bidder shall quote for fabrication along with material cost involved and its accessories.
3. Basic cost and GST shall be quoted separately.
4. The quotations must reach, **Head, Laser & Plasma Technology Division** by **04-02-2022** and must be sent in a sealed envelope *super scribed* with the above reference number and due date given above.
5. The address on the envelope should read:
Head, Laser & Plasma Technology Division
Bhabha Atomic Research Centre, Trombay, Mumbai-400 085.
(Attn.: **Y.Chakravarthy**)
6. The bidder shall have to take insurance policy against any material issued to him by the purchaser.
7. The fabrication work shall be subject to inspection by our engineer. The material shall not be dispatched prior to approval by our engineer at bidder's works. Necessary inspection facilities should be provided to our engineers during fabrication at bidder's premises.
8. The bidder shall complete the installation after approval by our engineer, within **months** from the date the firm purchase order is issued to the bidder. The finished components and the scrap from the free issue material shall be delivered by the bidder at **PRIP Shed, BARC, Trombay.**
9. Head, Laser & Plasma Technology Division, BARC, reserves the right to accept/reject any or all quotations without assigning any reason.
10. PAN number and GSTIN number must be given



(Dr. Srikumar Ghorui)
Head, TPTS, L&PT Division

Encl.: As above.

Copy to: Accounts Officer, GSS
Head, SIRD, BARC
In charge, Notice Board, V.S.Bhavan, Anushakti Nagar
BARC site notice board

The quotations will be opened at 16.00 Hrs on 07-02-2022

Relocation, Re-Installation, Re-Commissioning of Tungsten vacuum furnace

Scope of Work: we, TPTS, L&PTD, are using a high temperature tungsten vacuum furnace situated at PRIP Shed building. In order to accommodate other systems, we need to relocate existing vacuum furnace to a new location (within BARC). Scope of work includes relocation of existing vacuum furnace, Re-installation and Re-Commissioning of vacuum furnace at new site. The detailed specifications of work are given below.

1.1 Relocation of Vacuum furnace:

1. The supplier has to disconnect all the associated electrical cables, water pipe lines and air compressor lines before relocating the furnace.
2. After disassembling, the furnace has to be shifted to a new location (approx. 1km within BARC)
3. The supplier has to arrange transportation, loading and unloading of vacuum furnace at new location themselves.
4. At most care has to be taken to avoid any damage to vacuum furnace during shifting. The supplier has to repair any damage occurred during transport at their own cost.

1.2 Re-Installation at new site: scope of work includes re-installation at hall-9, design, fabrication, supply of water-cooling system for vacuum furnace including water pipe line connections as per below specifications.

1. The supplier should reconnect all electrical cable and earthing wires to existing outlets in hall-9.
2. Argon gas connections and air compressed line should be connected to existing gas manifold valve with a ½ inch metal pipe (approx. 3 mtrs)
3. The supplier should replace oil for rotary pump (6 liters) and diffusion pump (500ml)
4. If required the supplier should replace heating element with available spare

1.2.1 Fabrication of water-cooling system: Vacuum furnace requires continuous supply of chilled water to cool the furnace chamber and diffusion pump during operation. The specifications of chiller unit are given in table below.

1. Inlet (1½ inch) and outlet (2 inch) of vacuum furnace should be connected to chiller unit with SS304 pipes.
2. The total length of SS pipe is 40 meters approx. (both inlet and outlet). Complete SS pipes are suitable insulated to prevent heat loss into atmosphere.
3. The internal plumbing should include by pass valve for adjusting flow requirements
4. The width of chiller unit should not exceed 800mm
5. Chiller unit should be suitable for outdoor area operation
6. Hot air exhaust should be at top of chiller unit
7. The supplier should clearly mention important components of chiller clearly in the quotation like PHE, Pump, PID controller, type of RTD sensor, flowmeter, level controller, flow switch, pressure transmitter and regulator valve.

Chiller Unit Specifications

S.No	Parameter	Specification
1.	Cooling Capacity	5TR (Min) at 15C
2.	Working Temperature	0-15C
3.	Resolution	0.1C
4.	Temperature stability	±0.5C (PID control)
5.	Compressor	Air cooled (reputed make)
6.	Pump flow rate	25 LPM (min)
7.	Bath tank	Integrated (SS304 steel)
8.	Tank volume	500 liters (min)
9.	Noise level	60 dBA or less
10.	Castors	Wheels and grips for easy transport
11.	Display	Multi display with low and high T, warnings, Temp cutoff
12.	Filling level	Sight glass for level indicating
13.	Quantity	01 No

1.3 Re-Commissioning of Vacuum Furnace:

1. Prior to commissioning the supplier should check all connections, pneumatic systems, O-rings, heating element etc before switching on the furnace
2. The supplier should check all the valves and pirani gauges and test vacuum tightness of chamber.
3. The final vacuum in chamber should be 10^{-5} mbar or lower.
4. The supplier should demonstrate working of furnace. The furnace will be tested for a continuous operation of up to 6 hours at 2000C.

Other Terms & Conditions:

1. The supplier should have a prior experience in installation and commissioning of tungsten vacuum furnace and should have done similar type of work at least once in last 2 years. The supplier should provide a copy of WO/PO upon request.
2. The supplier should provide drawing details of chiller unit along with space requirement along with the quotation.
3. The transportation of material is in the scope of supplier
4. The supplier should clearly mention make, model and dimensions of chiller unit clearly in their quotation. Merely quoting "as per specifications", "agreed", "complied" etc. will be treated as technically incomplete and offer cannot be considered
5. Adequate precautions should be taken not to damage any existing cables, pipes and other installations during shifting process.
6. Necessary safety interlock like high pressure trip, low pressure trip, anti-freeze thermo stat, motor overload trip, dry run protection, single phase preventer etc. should be incorporated in chiller unit

7. The work also includes for all minor details which are obviously and fairly intended and which may not have been referred to in these documents but which are essential for the entire completion of work in accordance with Standard Engineering Practice.
8. The supplier is encouraged to take stock of furnace and site location at Hall-9.