



DEPARTMENT OF BIOTECHNOLOGY
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Professor and Head

Date: 24.07.2017

Ref: BT/GUHA/2017/002/SPL

Dt. 24.07.17

Due Dt.02.08.17

1. Quotations are invited in duplicate for the various items shown below/overleaf/ enclosed list.
2. The quotations duly sealed and super scribed on the envelope with the reference No. and due date, should be addressed to the undersigned so as to reach him on or before the due date stipulated above.
3. The quotations should be valid for sixty days from the due date and the period of delivery required should also be clearly indicated.
4. If the item is under DGS & D Rate Contract, Rate Contract Number and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the rate contract price. If so, please send copy of the R.C. (Please note that we are not Direct Demanding Officers).
5. Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be sent along with the Quotations, wherever applicable. Samples if called for should be submitted free of charges and collected back at the supplier's expenses.
6. **Local Firms:** Quotations should be for free delivery to this Institute. If quotations are for Ex-Godown, delivery charges should be indicated separately.
7. **Firms outside Chennai:** Quotations should be for F.O.R Chennai. If F.O.R. Consigner stationer freight charges by passenger train/lorry transport must be indicated. If Ex-Godown, Packing, forwarding and freight charges must be indicated.
8. The rates of Sales/General Taxes and the percentage of such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. Where this is not done, no claim for Sales/General Taxes will be admitted at any stage and on any ground whatsoever. **The taxes leviable should take into consideration that we are entitled to have concessional sales tax applicable to non-government educational institutions run with no profit motive for which a Concession. Sales tax certificates will be issued at the time of final settlement of the bill.**
9. Goods should be supplied carriage paid and insured.
10. Goods shall not be supplied without an official supply order.
11. **Payment:** Every attempt will be made to make payment within 30 days from the date of receipt of bill/acceptance of goods, whichever is later.

IN-SITU GLASS FERMENTER SPECIFICATION

1. Type : In-situ sterilizable laboratory fermenter for microbial cultivation
2. Capacity: 2-3 litres Total volume, In-situ sterilizable glass vessel, flat bottom including SS rupture production jacket.
3. Agitation system :
 - a) Agitator: 6 blade Rushton impeller, SS 316, two pieces, for radial mixing, height adjustable
 - b) Drive system : direct drive from bottom by servo motor with mechanical seal, 20-1400 RPM controlled speed.
 - c) Aeration: Aeration tube with ring sparger for efficient and careful submerged and suitable for high density culture
 - d) Ventilation: Exhaust gas condenser
4. Temperature circuit: Electrical heating finger 450 W x 2nos and cooling finger with solenoid valve to control temperature during sterilization and cultivation.
5. Measurement and system :
 - a) Temperature control: Sterilizable PT 100 temperature probe and temperature controller activating actuators of heating-cooling system. Allows to measure and control vessel temperature within 4 to 130^oC accuracy ± 0.1 ^oC.
 - b) speed control : Measurement and control of agitation speed, accuracy 20-1400 RPM ± 1
 - c) pH control :*In situ* sterilizable pH-probe and pH controller activating both a base pump and an acid pump. Measurement and control of pH value between pH 2-12, ± 0.05 C.
 - d) pO₂ : *In situ* sterilizable DO (pO₂)-probe with DO -controller, activating actuators and secondary controllers as media addition pump, stirrer speed and gas flow valves by configurable cascade control. For measurement and control of DO between 6 ppm and saturation, $\pm(1\%+6\text{ppm})$.
 - e) Antifoam/Level :*In situ* sterilizable conductive level or foam probe with controller Activating a pump for either harvest or dosage of antifoam agent.
6. Three fixed speed peristaltic pump inbuilt in the panel itself. (Flow rate 45ml/min)
7. PLC based DDC system with open end OPC server enable to interface Other device
8. SCADA for set point control , complete data logging and data management
9. HMI via PC interface. System Configuration. Windows 7/10 4GP RAM. 500GB hard disc, 18" monitor. Comport, DVD Writer, key board and mouse.
10. Vendor should have service in Chennai; should have supplied the instrument to IITM before; should show journal references; Ability to connect another fermentor to the same controller in future i.e. controller should be able to control 2 units at the same time; Regulatory compliance: CE
11. Optional accessories: Compressor, chiller as required