



DEPARTMENT OF BIOTECHNOLOGY
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Professor and Head

Date: 21.09.2016

Ref: BT/GUHA/2016/017/SPL

Dt. 21.09.16

Due Dt.07.10.16

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.

FERMENTER SPECIFICATION

1. **Type** : *In-situ* sterilizable laboratory fermenter for microbial cultivation
2. **Capacity** : 2 - 3 litres Total volume, *In-situ* sterilizable glass vessel
3. **Agitation system** :
 - a. Agitator: 6 blade Rushton impeller, SS 316, two pieces, for radial mixing, height adjustable Drive system: direct drive from bottom by brushless DC motor with mechanical seal, 30-1500 RPM controlled speed
 - b. Aeration: Aeration tube with ring sparger through rotameter
 - c. Ventilation: Exhaust gas condenser; stainless steel, with connections for cooling water supply and return, including closing and adjustment valve for cooling water.
4. **Temperature circuit**: Electrical heating finger/jacket
5. **Measurement and system** :
 - a. Temperature control: Sterilizable Pt 100 temperature probe and temperature controller. Allows to measure and control vessel temperature within 4 to 130°C accuracy $\pm 0.1^{\circ}\text{C}$.
 - b. Speed control : Measurement and control of agitational speed, accuracy 30 - 1500 RPM ± 0.1
 - 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, 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
6. **I/O package with additional Interfaces and controllers, freely configurable**

Communication through RS232 port. Additional ports for future use like adding gas analyzer. All inputs and outputs are available on sockets at the control cabinet housing and can be easily configured with suitable software allowing adding external equipment at any time without updating the software.
7. **Pump** module with 1 variable for media feed/antifoam and 2 fixed pumps for acid and base.
8. **One process control system for up to six fermenter units.**

Programming and management of user profiles, security enter passwords (various levels), Password management.

Trends, process data visualization with scalable timeframe, 2 D and 3 D bar charts

Alarm and Warning Management: Set points, Alarms, Warnings and Acknowledgement, visual and acoustic notification.

Status line with chronological event list

Record management.

9. Warranty : 2 years

10. Should have supplied such instrument to IIT Madras previously also

11. Should have international supply and service

12. Should have journal publication references

13. Should have servicing facility at Chennai

14. Two-bid system: separate technical and financial bids

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