



**DEPARTMENT OF BIOTECHNOLOGY**  
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MUKESH DOBLE  
Professor and Head

Date: 26.11.2013

**Ref: BT/GUHA/2013/48/SPL**

**Dt. 26.11.13**

**Due Dt.09.12.13**

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 / Bioreactor Specifications

Total Volume: 2-3 litres

Aspect ratio: 2:1

Sterilization: Autoclavable

Motor: Top-driven

Material of Construction: Glass

Control: PID control

pH: 2 to 12,  $\pm 0.01$

Temperature: controlled through jacket or heating element: 5 C to 150 C  $\pm 0.1$  C

Foam

Level

Agitation: 50 – 1000 rpm  $\pm 5$  rpm

DO:

cascade control 0-100%

Thermal mass flow controller (TMFC)

Optional: Load cell

Controller: Microprocessor

Measurement:

pH: Mettler-Ingold gel-filled probe

Sterilizable with 2 point calibration and automatic temperature correction

Resolution: 0.01 pH units

DO:

Mettler- Ingold polarographic probe

Sterilizable with 2 point calibration

Foam/Level: Conductive probe

Temperature: Pt100

Sampling

Optional: Exit gas - Oxygen and Carbon-dioxide

Pumps:

Nos: 4

Make: Watson- Marlow

Type: Integrated peristaltic pumps with at least 1 variable speed pump

Aeration:

Through rotameter to Ring sparger and headspace

0 to 5 lpm

Heating: Electric jacket or finger

Impeller: 6 blade Rushton turbine

Ports: Sampling (1), harvest (1), addition (5)

Baffles: SS 216 (4)

Optional Accessories:

Chiller: 4 to 10 C, 15 lpm

Air compressor: Oil-free; 0-25 lpm; 4-6 bar

Display: Touchscreen or LED

Others:

Exhaust condenser – stainless steel

Stand-alone or PC operation flexibility

Software: SCADA or equivalent

Regulatory compliance: CE, EU

Reliable performance backed by journal papers

Should have international supply and service

Should have supplied to IIT Madras before or should be able to give a satisfactory demonstration of the product or a reference from a reputed lab in Chennai

Should have service in Chennai

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

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