

**Department of Chemical Engineering**  
**Indian Institute of Technology, Delhi**

March, 1<sup>st</sup> 2013

**Subject: Quotation for BIOMASS ONLINE PROBE FOR BIOREACTOR**

**Following Specification are required for BIOMASS ONLINE PROBE FOR BIOREACTOR**

**Tender specification**

Frequency Range	:	50 KHz to 20 MHz
Measuring Ranges	:	Capacitance: 0.0 to 400pF/cm Conductivity: 0.0 to 40mS/cm $\pm$ 0.1mS/cm
Typical cell Concentration ranges	:	Depends on cell size but typically; Yeast (6 $\mu$ m) – $1 \times 10^6$ to $10^{10}$ Bacteria (1 $\mu$ m) – $1 \times 10^9$ to $10^{13}$ Animal cell (12 $\mu$ m) – $1 \times 10^5$ to $10^9$ Plant cell (50 $\mu$ m) – $1 \times 10^3$ to $10^8$
Resolution	:	Resolution: 0.1pF/cm. Approx for bacteria (E.coli) 0.1g/L dry weight or $1 \times 10^9$ cells/mL. Yeast or animals cells 0.05g/L or $1 \times 10^5$ cells/mL
Accuracy	:	Typical better than $\pm 3\%$ or $\pm 2\%$ of the reading.
Stability	:	$\pm 0.2$ pF/cm at constant temperature with standard conductivity solution of approximately 12mS/cm.
Linearity	:	$\pm 1\%$ over 100 pF/cm.
Precision	:	Typically $< \pm 0.5$ pF/cm, no filter active.
Power supply	:	110VAC -240VAC mains.
Probe type	:	Annular; 12mm (dia) x 320mm probe
Analog output	:	4-20mA module
Software	:	Included
Warranty	:	1 Year

**Terms and Conditions:**

- 1 Quotations must be made in sealed envelopes. Technical and Commercial bids must be sent separately in two sealed envelopes and then put together in one envelope. The quotes must reach the following address by 8<sup>th</sup> April, 2013 by 17: 00 hours latest.**

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Hauz Khas, New Delhi – 110016**

- 2 Price must be quoted CIF New Delhi.**
- 3 Please specify warranty periods.**
- 4 Indian agency certificate must be enclosed. Proprietary certificate might be enclosed if applicable.**
- 5 Payment through L/C.**
- 6 Validity of quotation should be at least 3 months.**
- 7 Period of delivery should be mentioned.**
- 8 Educational discount should also be mentioned.**

**Remarks: The Institute reserves the right to accept or reject any all the quotations without assigning any reason thereof.**

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