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Ref. No. AK/BSBE/2011-12/01

Subject: Request for submission of quotation for CO_2 Incubator.

Please send a sealed quotation for CO_2 Incubator for our laboratory at Department of Biological Sciences and Bioengineering, IIT Kanpur with specification and requirement as given in the attached sheet. The quotations should include taxes, warranty, educational discounts if any, freight and delivery. The quotation should reach our office on or before 14.11. 2011.

Thanking You,

Sincerely,

(Ashok Kumar)
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Specifications of CO_2 Incubator

- Internal Volume not more than 151 Liters or 5.3 Cu Ft.
- The chamber air should be circulated mechanically using fan for better temperature, % Co2 and % RH uniformity.
- Temperature Range Ambient+3°C to 55°C
- Temporal Temperature Deviation ±0.1°C in accordance with DIN 12 880, part 2
- Spatial Temperature Deviation ± 0.5°C
- Should be able to operate at a maximum ambience temperature from + 18°C … 33°C
- Temperature Recovery at 37° C should be less than 10 min after 30 sec door opening, to 98% of initial value.
- RH level attainable ≥ 95 % RH
- Recovery time at 95 % rH ≤ 30 min after 30 sec. door opening, to 96 % of initial value
- Co2 Control 0 … 20%
- Control accuracy ± 0.1 %
- Recovery time for 5% CO2 ≤ 5 min after 30 sec door opening, to 98% of initial value.
- A precise temperature sensor (PT1000) should control the air jacket heating for a uniform temperature.
- An over-temperature protection should be implemented for cell safety. In case if primary temperature control circuit fail, there should be a mechanism to sense this failure and the secondary temperature control circuit should take over and maintain the temperature set point.
- The CO_2 concentration should be measured and controlled by a reliable thermo-conductivity detector (TCD), which should be auto-calibrated in every auto-start routine.
- The CO_2 Incubator is equipped with the active humidification system. Instead of a water pan, the whole bottom of the chamber should be used as a water reservoir. The large water surface area and the direct transfer of heat from the chamber bottom into the water leads to high evaporation rates.

- The CO_2 Incubator should not have a water pan, no duplicate side walls, no hidden air ducts. The shelf system should be reduced to a minimum with keeping the number of shelves.
- The shelf system should be easy to mount and take off, the shelves should have a travel stop to avoid tipping when dragged out too far
- The stainless steel chamber should be electro-polished to achieve a very smooth surface.
- All corners and edges should be coved. Screws and bolts should have been eliminated. This makes cleaning easy.
- All door gaskets should be easily removable and re-installable without tools making cleaning easy.
- The CO_2 Incubator should have a user-friendly control panel with a large, clear display.
- The back of the chamber should be equipped with an 42mm access port as standard to facilitate installation of appliances, like stirrers or rollers.
- The CO_2 incubator should be easily be stacked to save floor space.
- Approximate weight of the unit without load 70 Kg's.
- In addition to standard full width shelves an optional $1/3^{rd}$ width shelves should be available to facilitate easy sample handling.
- Optional support stand with castors should be available for easy mobility.