University of Delhi, South Campus
Central Instrumentation Facility

No. UDSC/CIF/2022/Ultra Centrifuge Date: 20.12.2022

Quotations are invited through GeM/ CPP portal (e-procurement) under 2-bid system for **Technical Specifications** with FOR destination price to be quoted in INR for University of Delhi, South Campus. The quote should be inclusive of all taxes and duties for supplying and installation of the item as described below.

Name of the equipment: **Floor Model Ultra centrifuge**

Quantity: **One**

Ultra-Centrifuge should have the following control specifications

1. Maximum RCF (x g): 8,00,000g or more
2. Maximum RPM: 100,000 rpm or more
3. Speed Control: ±2 rpm of set speed
4. Set Temperature: 0 to 40ºC in 1ºC increments
5. Temperature Control: ± 0.5ºC of set temperature
6. Temperature display: Actual rotor temperature in 0.1°C increments
7. Large touch-screen display with adjustable positions
8. Drive type: Imbalance tolerant direct drive, eye balance to within 5 mm,
9. Refrigeration system: Thermo electric temperature control system and non-coolant based.
10. Vacuum system: Moisture purging / Moisture removal system
11. Temperature range should be from 0 Degree to 40 degree with 1 degree increment.
12. Ambient operating rage should be 10 to 30*C
13. Acceleration / Decelerations profile: 10/10 or more
14. System should come with color large LCD Movable touch screen operation for RPM / RCF / Temp. / Time (Run / Hold) / Vacuum display with error alarms.
15. Convenient rotor catalogue and rotor tracking by serial number
16. The centrifuge must have optical disc and rotor inertia technologies for rotor sensing to calculate rotor inertia energy and stops the system to prevent rotor failures if rotor run above its energy- safety feature.
17. The centrifuge should have for Fixed Angle, Swinging Bucket Rotor, Near Vertical rotor and vertical rotor to carryout analysis in different volumes within same rotor without compromising on g-force and RPM.
18. Machine should be brush-less high frequency direct drive motor and have features like Delayed start/ stop, dual display of 'Run' & 'Set' parameters, Real Time Control, etc.
19. The centrifuge must be supplied with factory installed Simulation software feature which can provide Sedimentation Coefficient & Protocol Optimization before the experiment run.
20. Wide voltage tolerance ranges from approx 185 – 260V AC.
21. Should be equipped with HEPA filter (atleast 0.2 µm) for preventing the risk of spreading of spilled microbial samples and biosafety. Should have multiple levels of Biosafety built in.
22. Should come with Tube Slicer to slice the tubes for gradient experiments.
23. Machine should be supplied with an appropriate UPS and Stabilizer for smooth running.
24. **Machine should be quoted with rotors made of Titanium material having the following specifications*. Requisite tubes and accessories for its optimal usage should be provided.***

A. One fixed angle rotor capable of going up to 100,000 RPM (about 800,000 g, volume per tube 6 ml approx) along with necessary tubes and adapters to run smaller volume of 2 ml in the same rotor at 100,000 rpm without reduction in g force of 800,000 g force. Requisite tubes and accessories should be provided.
B. One swingout bucket rotor capable of running up to 32,000 RPM (about 175,000 g, volume per tube 35-40 ml approx. along with tubes and adapters. Accessories to run smaller volume of 15ml in the same rotor at 32,000 rpm without reduction in g force of 175,000 g force.
C. One swing bucket rotor capable of running up to 41,000 RPM (about 280,000 g, volume per tube 13 ml approx. along with tubes for 13ml and adapters and accessories to run smaller volume of 4 ml in the same rotor at 41,000 rpm without reduction in g force of 280,000 g force.
D. One swing bucket rotor capable of running up to 60,000 RPM (about 480,000 g, volume per tube 4 ml approx. along with tubes for 4ml and adapters and accessories to run smaller volume of 1.5 ml in the same rotor at 60,000 rpm without reduction in g force of 480,000 g force.

The Ultracentrifuge should have the following preferred features or equivalents:

1. Drive Cooling: Air-cooled
2. Adaptors to accommodate small volume samples without sacrificing the maximum g force of the rotor
3. Ability to remove moisture with vacuum
4. A solid-state thermopile shall monitor the chamber temperature
5. The centrifuge should be supplied with factory installed simulation Software
    i. With inbuilt calculations, simulations and references
    ii. With Real-time run graphing
    iii. With Powerful on-board simulation and calculation tools

Optional Items to be quoted:

1. An automated gradient maker with the capability to make continuous gradients that can be used in the swing bucket rotors above (24.B, 24.C & 24.D) should be quoted as an optional Item. It should include tube holders and accessories that might be required. The accessory can be manufactured by OEM or Non-OEM vendor.

The following tubes and accessories should be quoted per packet

2. Quick seal polyallomer tube's ability to hold 2, 3.5, 5.1 and 6ml having capacity to withstand 800,000xg. Tubes must be compatible with rotor specifications in 24.A
3. Adapters/Spacers/Caps and accessories to hold 2, 3.5,5.1 and 6ml tubes with rotor specification in 2.4A
4. Thickwall polyallomer (max. vol. 31ml) tubes having capacity to withstand 175,000xg. Tubes must be compatible with rotor specifications in 24.B
5. Thickwall polycarbonate (max. vol. 31ml) tubes having capacity to withstand 175,000xg. Tubes must be compatible with rotor specifications in 24.B
6. Thinwall polyallomer (max. vol. 38.5ml) tubes having capacity to withstand 175,000xg. Tubes must be compatible with rotor specifications in 24.B
7. Ultraclear (max. vol. 38.5ml) tubes having capacity to withstand 175,000xg. Tubes must be compatible with rotor specifications in 24.B
8. Thinwall polyallomer (max. vol. 13.2ml) tubes having capacity to withstand 288,000xg. Tubes must be compatible with rotor specifications in 24.C

9. Ultraclear (max. vol. 13.2ml) tubes having capacity to withstand 288,000xg. Tubes must be compatible with rotor specifications in 24.C
10. Thinwall polyallomer (max. vol. 4ml) tubes having capacity to withstand 485,000xg. Tubes must be compatible with rotor specifications in 24.D
11. Ultraclear (max. vol. 4ml) tubes having capacity to withstand 485,000xg. Tubes must be compatible with rotor specifications in 24.D

Important information:

1. The quotation should be addressed to the "Chief Executive Officer, Institute of Eminence, University of Delhi, Delhi-110007". The quote should be submitted with all terms and conditions and necessary documents latest by end of tender date.
2. The second part, Financial bid, should contain item-wise pricing of items mentioned in the Technical bid.
   a. F.O.R. UDSC price to be quoted which includes clearance charges and transportation charges to site of installation and any other requirement for installation at site.
   b. IGST/CDEC will be provided.
   c. Payment will be made against successful installation.
3. Both the quotation documents/ bids are to be submitted through GeM/ CPP portal of the Government of India only (e-procurement). Hard copies of bid will not be accepted.
4. The successful bidder must provide a performance bank guarantee (PBG) as per Rule 171 GFR 2017 totaling 5% of the value of the main machine quoted with a validity of 60 days upon completion of the warranty period. The PBG should be in favour of "Chief Executive Officer, Institute of Eminence, University of Delhi, Delhi-110007". PBG must be provided at the time of installation to avoid delay in payment release.
5. The successful bidder must provide a performance bank guarantee (PBG) as per Rule 171 GFR 2017 totaling 5% of the value of the main machine quoted with a validity of 60 days upon completion of the warranty period. The PBG should be in favour of "Chief Executive Officer, Institute of Eminence, University of Delhi, Delhi-110007". PBG must be provided at the time of installation to avoid delay in payment release.
6. The bidder will have to quote all items together. Partial quotes will not be accepted. For each item, the make, model and technical specifications and quantity have to be mentioned clearly. Original brochure must be provided.
7. **<u>Warranty /Comprehensive Maintenance</u>**
   a. Machine should be warranted for minimum 12 months from the date of installation.
   b. Warranty up to 5 years on the machine from date of installation after expiry of standard warranty should be quoted, year wise under optional items in the price bid.
   c. Installation and commissioning to be completed up to the satisfaction level of the technical purchase committee followed by training and handling by the bidders
8. The quote should be valid for 90 days from the last date of submission of bid.