

**Global Tender Notification for the procurement of “Ultracentrifuges  
& Accessories” at the Indian Institute of Science, Bangalore  
(TENDER FROM FOREIGN VENDORS)**

Date: 1<sup>st</sup> December, 2021

**Last date of submission of tenders:** 15<sup>th</sup> December 2021

**To Whom It May Concern**

This is to seek quotations valid for 90 days for the supply of equipment as per the specifications described below. A quotation should clearly indicate the terms and conditions of the vendor, delivery schedule, applicable taxes, payment terms etc. The tender should be submitted in two separate sealed envelopes – one containing the “Technical bid” and other containing the “Commercial bid”, both of which should be duly signed and must reach the undersigned on or before 17:00 hours, 15<sup>th</sup> December, 2021.

Please note:

1. Quote should come only from Foreign/ International Original Equipment Manufacturer (OEM) or their Indian authorized distributor.
2. The quotations should be on FOR-IISc Bangalore basis in INR only

Quote/bids should be addressed to:

**The Chair  
Department of Microbiology & Cell Biology,  
Division of Biological Sciences,  
IISc, Sir CV Raman Avenue, Bengaluru 560 012**

## **TENDER SPECIFICATIONS**

### **FLOOR MODEL ULTRA CENTRIFUGE – 02 units**

#### **1. Objective:**

To provide tender specifications for Floor Model Ultracentrifuges

#### **2. Operational Control Requirements:**

##### **Centrifuge should have the following control specifications**

1. Maximum Speed: 100,000 rpm and above
2. Maximum RCF ( x g): 800,000 and above
3. Set Speed Control Accuracy:  $\pm 2$  rpm of set speed (above 1,000 rpm) or better
4. Set Temperature: 0 to 40°C in 1°C increments
5. Temperature Control:  $\pm 0.5^\circ\text{C}$  of set temperature
6. Temperature display: Actual rotor temperature in 0.1°C increments
7. Ambient Operating Range: 10 to 35°C
8. Acceleration Profiles: 10
9. Deceleration Profiles: 11
10. Set Speed: 1,000 to 100,000 rpm in 100 rpm increments
11. Set Time: Up to 999 hours 59 minutes
12. User- Defined Programs: 1,000 with up to 30 steps each
13. User Profiles: 50 unique users and passwords
14. Large touchscreen displays with adjustable positions (swivel and tilt)
15. Adapters/kits to adapt small samples in larger rotors without sacrificing the maximum force of the rotor, to shorten separation time up to 50 percent.
16. Vendor should have Certified free & Sterile Ultra Centrifuge tubes with no detectable DNA, RNA or any endotoxin which prevents sample degradation for Genomics, Exosomes & Proteomics workflow.

#### **2. Networking**

1. Instrument should be compatible with Mobile app. Monitoring the centrifugation status from a different room from the one in which the main unit is installed results in prevention of biohazards as well as saving on time and labor.
2. Shall have provision to print directly from the centrifuge or networked printer

#### **3. Swinging Bucket Rotor: 6 x 13-14mL (Quantity – 02 Numbers)**

1. Rotor Maximum Capacity: 78-84mL
2. Rotor Maximum Speed: 41,000 RPM or more
3. Rotor Maximum Force: 286,000 x g or more
4. Rotor k-factor: 124 or less
5. 100 numbers of 13.0-14.0mL thin walled polyallomer and 100 numbers of 13.0-14.0mL tubes to be included along with the rotor along with other accessories.  
These tubes should run at the same g-Force of the rotor of 286,000 x g.

6. 50 numbers of 3.0-4.0ml and 8.5-9.0ml to be included along with rotor along with 6 numbers of adapters or spacers.
7. Material: Swinging-Bucket Rotor, Titanium Head, and Buckets (black buckets)

**4. Fixed Angle Rotor: 12 x 13.0-14.0mL (Quantity – 01 Number)**

1. Rotor Maximum Capacity: 155-168mL
2. Rotor Maximum Speed: 70,000 RPM or more
3. Rotor Maximum Force: 450,000 x g or more
4. Rotor k-factor: 36 or less
5. 18 numbers of 10-12ml or more Polycarbonate bottle assembly to be provided along with the rotor
6. 50 numbers of 10-12ml thick wall polypropylene tubes with required spacers to be quoted.
7. Material: Titanium
8. Proper tool kits and Tube cap vise kit to be quoted along with the rotor.

**5. Fixed Angle Rotor: 8 x 38.0-40.0mL (Quantity – 01 Number)**

9. Rotor Maximum Capacity: 300-320mL
10. Rotor Maximum Speed: 70,000 RPM or more
11. Rotor Maximum Force: 500,000 x g or more
12. Rotor k-factor: 44 or less
13. 18 number of 26.0-28.0ml Polycarbonate bottle assembly to be provided along with the rotor.
14. 50 numbers of 30-32ml thick wall Polyallomer tubes to be provided along with the rotor with proper adapters.
15. 50 number of 38-40ml thin wall polyallomer tubes to be provided along with the rotor with proper adapters.
16. Rotor Material: Titanium
17. O-Rings, Overspeed disc for the rotor to be provided.

**6. Swinging Bucket Rotor : 6 x 14-15mL (Quantity – 01 Number)**

18. Rotor Maximum Capacity: 80-86mL
19. Rotor Maximum Speed: 40,000 RPM or more
20. Rotor Maximum Force: 285,000 x g or more
21. Rotor k-factor: 137 or less
22. 50 numbers of 3.0-4.0mL Polyallomer tubes to be provided along with the rotor with suitable adapters. These tubes should be able to run at the same gForce of the rotor of 285,000 x g.
23. 100 number of 14.0-15.0ml thin walled polyallomer and 100 number of 14.0-15.0ml Ultra clear tubes to be included along with the rotor. These tubes should run at the same gForce of the rotor of 285,000 x g.
24. Material: Swinging-Bucket Rotor, Titanium Head, and Buckets (red buckets)

**7. Swinging Bucket Rotor: 6 x 38.0-40.0mL (Quantity – 01 Number)**

1. Rotor Maximum Capacity: 228-240ml
2. Rotor Maximum Speed: 32,000 RPM or more
3. Rotor Maximum Force: 175,000 x g or more
4. Rotor k-factor: 204 or less

5. 50 numbers of 36.0-39.0mL thin wall polyallomer tubes to be provided along with the rotor with proper adapters. These tubes should be able to run at the same gForce of the rotor of 175,000 x g.
6. 100 number of 36.0-39.0mL clear tubes and 50 number of 30.0-31.0ml thick wall polycarbonate tubes to be included along with the rotor. These tubes should run at the same gForce of the rotor of 175,000 x g.
7. 50 numbers of 14.0-15.0ml polyallomer tubes to be provided along with the rotor with proper adapters. These tubes should be able to run at the same gForce of the rotor of 175,000 x g.
8. Cordless tube sealer to be included along with other required accessories.
9. Material: Swinging-Bucket Rotor and Buckets, Titanium

8. **Specific System Requirements:**

1. Braking: Regenerative with power reclamation
2. Drive: Frequency-controlled, brushless direct-drive induction motor
3. Drive Cooling: Air-cooled
4. Maximum Heat Dissipation: 3400 BTU/hour (1.0kW)
5. Noise Level 1 meter in front of Centrifuge: <51 dBA
6. Power tolerance range: 190 to 250 VAC or better
7. Moisture purging and diffusion pump vacuum system
8. A solid-state thermopile shall monitor the chamber temperature
9. Humidity restrictions: <80% at <35°C (non-condensing)
10. Shall give audible sounds for: Boot up, Start of Run, End of Run, Diagnostics/Alert, vacuum low enough to open door
11. Advanced Software features:
  - i. On-board software with inbuilt calculations, simulations and references
  - ii. Real-time run graphing
  - iii. Powerful on-board simulation and calculation tools
  - iv. Speed/temperature vs. time plot
  - v. Step-by-step zonal/CF operation screens
  - vi. On screen help
  - vii. Online rotor calculator intelligent software to calculate, configure and convert RCF, RPM without manual intervention.

9. **Safety Requirements:**

- a. The door shall be of high-strength structural steel chamber with a solenoid interlock to prevent operator contact with a spinning rotor
- b. Shall lock automatically when the door is closed, and a run begins
- c. An imbalance detector shall monitor the rotor during the run, causing automatic shutdown if rotor loads are severely out of balance
- d. Shall have over speed system to ensure that the rotor does not exceed its maximum allowable speed
- e. Shall have an inbuilt mechanism to calculate rotor inertial energy and stops the system to prevent rotor failures.
- f. Shall have optional dual HEPA filter of 0.2micron

**Specification for Table top Ultra Centrifuge – 01 Unit**

Ultra-Centrifuge should be a Table top model and must have large, full color touch screen graphical user interface (GUI) which is intuitive, easy to use, and can be read from a long distance

**10. Specifications:**

- a. Forces to 1,019,000 x g at speeds to 150,000 rpm (2,500 revolutions per second)
- b. Sound Level: Quiet-less than 47dBA
- c. Set temperature: 0 to 40oC in 1oC increments
- d. Heat output not to exceed 2,400 BTU/hour (0.7 kW/hour)
- e. Moisture purging vacuum system permits continuous removal of moisture to prolong vacuum pump oil life
- f. Speed control of +/- 50 rpm and temperature control of +/- 2°C
- g. Imbalance tolerance of up to 10% in opposing tubes.
- h. Ten acceleration and eleven deceleration profiles independent of rotor weight
- i. Thermoelectric heating/cooling; no refrigerants / compressors
- j. Automatic rotor lock-down requiring no manual locking procedures
- k. Auto restart after power failure
- l. User defined programs: Unlimited
- m. Must be able to offer remote control and monitoring (via Ethernet connection) to run the system from outside the lab or standard biosafety hood.
- n. Must be able to export run data in .csv format to Microsoft Excel or other spreadsheet formats through the standard USB port to a flash drive.
- o. Must have an air-cooled direct drive system that requires no brushes, gears or high-speed bushings. This provides efficient operation and long-life of the instrument.
- p. Must be able to safely insert and remove rotors without manual locking mechanisms. Automatic rotor locking allows secure, fail-safe rotor fastening for the greatest reliability and speed.
- q. Remote control of instrument from multiple sources including computer, or by cell phone, iPod touch, iPad.
- r. HEPA filter option should be available.
- s. Adapters/kits to adapt small samples in larger rotors without sacrificing the maximum force of the rotor, to shorten separation time up to 50 percent.

**11. Fixed Angle Rotor : 8x2.0ml ( Quantity – 01 )**

- a. Max. RPM: 150,000 RPM or more,
- b. Max. RCF: 1,000,000 x g or more,
- c. k Factor – 11 or less,
- d. Number of Tubes: 8 x 2.0mL,
- e. Rotor Capacity: 16mL
- f. Material: Titanium

**Tubes to be included:**

100 numbers of 2.0ml polyallomer tubes to be provided along with other accessories.

**12. Near Vertical Rotor : 8x1.0-1.5ml ( Quantity – 01 ):**

- a.* Max. RPM: 120,000 RPM or more,
- b.* Max. RCF: 5,85,000 x g or more,
- c.* k Factor – 7 or less,
- d.* Number of Tubes: 8 x 1.0-1.5ml,
- e.* Rotor Capacity: 8.0 - 9.5ml
- f.* Material: Titanium

**Tubes to be included:**

100 numbers of 1.0-1.5ml polyallomer tubes to be included along with the rotor. These tubes should run at the same gForce of the rotor of 585,000 x g.

Cordless tube sealer to be included along with other required accessories.

13. **Warranty:** 05 years from the date of installation for both Floor model (2 units) and Table top Ultracentrifuge system.