

## PART 1 SCHEDULE OF REQUIREMENTS

PR No.: 104/2018-19

Name of equipment : Floor model Ultracentrifuge  
Dept : Mother and Child Health  
Quantity : 1

### Technical Specifications for Floor model Ultracentrifuge

**1. Operational Control Requirements:** Centrifuge should have the following control specifications

- a. **Maximum Speed:** 100,000 rpm or more
- b. **Maximum RCF ( x g):** 800,000 or more
- c. **Speed Control:**  $\pm 2$  rpm of set speed
- d. **Set Temperature:** 0 to 40°C in 1°C increments
- e. **Temperature Control:**  $\pm 0.5^\circ\text{C}$  of set temperature
- f. **Temperature display:** Actual rotor temperature in 0.1°C increments
- g. **Ambient Operating Range:** 10 to 35°C or more
- h. **Acceleration Profiles:** 10 or more
- i. **Deceleration Profiles:** 11 or more
- j. **User - Defined Programs:** 1,000 with up to 25 steps each or better
- k. **User Profiles:** 45 unique users and passwords or better
- l. **Sample imbalance tolerance:**  $\pm 5$  ml or 10% whichever is greater
- m. **Large touch - screen display with adjustable positions.**
- n. **Drive:** Frequency-controlled, brushless direct-drive induction motor.
- o. **Instrument should have a safety feature to avoid overspeeding of the rotor by method of checking the inertia of the rotor.**
- p. **Instrument should have adaptors to accommodate small volume samples without sacrificing the maximum g force of the rotor.**
- q. **Instrument with separate/dual sensor for chamber and rotor should also be quoted.**

**2. Rotor Specific Requirements:**

**Fixed Angle Rotor:**

**A)**

- a. **Rotor Maximum Capacity:** 6 x 94 mL
- b. **Rotor Maximum Speed:** 45,000 rpm or more
- c. **Rotor Maximum Force:** 235,000 x g or more
- d. **Rotor k - factor:** 133 or less
- e. **Material: Titanium only**

**B)**

- a. **Rotor Maximum Capacity:** 10 x 2.0 mL
- b. **Rotor Maximum Speed:** 120,000 rpm or more
- c. **Rotor Maximum Force:** 627,000 x g or more
- d. **Rotor k - factor:** 8
- e. **Material: Titanium only**
- f. **Thinwall polyallomer tubes of 94 ml** that can be run at 45,000 rpm and 235,000 x g should be supplied. Qty- 100 tubes

- g. **Polycarbonate Bottle assembly of 70 mL** that can be run at 45,000 rpm and 235,400 x g should be supplied. (Qty 12 bottles).
- h. **Thickwall Polyallomer tubes of 10 ml** capacity that can be run at 39,000 rpm and 156 000 x g should be supplied. These tubes are best suited for differential centrifugation of subcellular fractions and viral proteins. Qty- 50 tubes
- i. Appropriate accessories to be quoted (**adapters and caps**).

### Swinging Bucket Rotor:

#### A)

- a. **Rotor Maximum Capacity:** 6 x 38.5 mL
- b. **Rotor Maximum Speed:** 32,000 rpm
- c. **Rotor Maximum Force:** 175,000 x g
- d. **Rotor k - factor:** 204
- e. **Material: Titanium only**

#### B)

- a. **Rotor Maximum Capacity:** 6 x 5 mL
- b. **Rotor Maximum Speed:** 55,000 rpm
- c. **Rotor Maximum Force:** 368,000 x g
- d. **Rotor k - factor:** 48
- e. **Material: Titanium only**
- f. **Thinwall ultra clear tubes of 38.5 ml and 5 ml** (transparent) that can be run at **32000 rpm and 55,000 rpm** respectively should be supplied. (Qty-100)

C) **Drive Cooling:** Air-cooled

D) **Noise Level 1 meter in front of Centrifuge:** <52 dBA or less

E) **Refrigeration System:** Thermoelectric/ Refrigerated with non CFCs and non ODCs

F) **Power tolerance range:** 190 to 264 VAC or better

H) Ability to remove moisture with vacuum

I) After power interruption/failure, centrifuge should resume the run from the last recorded parameters once the power is resumed

J) Chamber temperature should remain as set for 5 minutes after the door is open for back to back run

K) A solid state thermopile shall monitor the chamber temperature

L) **Humidity restrictions:** <80% at <35°C (non-condensing) or better

M) **Shall give audible sounds for:** Boot up, Start of Run, End of Run, Diagnostics/Alert, Vacuum low enough to open door

N) **Power Requirement:** 200-240V, 30 A, 50Hz

O) Shall have a **provision to release the vacuum** in the centrifuge manually in case of power failure after rotor coming to rest

P) **Advanced Software features:** The software should be inbuilt on the machine to perform calculations, simulations and reference guide.

- a. Expert software with inbuilt calculations, simulations and references
- b. Real-time run graphing
- c. Powerful on-board simulation and calculation tools
- d. Speed and temperature vs. time plot
- e. Step-by-step zonal/CF operation screens
- f. On screen help

### 3. Safety Requirements:

A) An imbalance detector shall monitor the rotor during the run, causing automatic

shutdown if rotor loads are severely out of balance

B) Shall have over speed system to ensure that the rotor does not exceed its maximum allowable speed

C) Shall have optional HEPA filter

D) Shall have an inbuilt system to calculate rotor energy/inertia and stop the centrifuge to prevent rotor failures

E) Vendor should have training and application lab in India for after sales support.

#### **4. Warranty:**

1) The unit must be provided with all necessary accessories with 3 years comprehensive and 2 years non-comprehensive warranty from the date of satisfactory installation of equipment.

2) 10KVA stabilizer should be provided at the time of installation.

#### **5. Others:**

a. Installation, validation, calibration and performance demonstration should be carried out at site and all necessary certificates should be provided.

b. All the necessary documents (IQ/OQ/PQ) and certification should be provided at the time of installation.

c. The unit must be quoted by manufactures & Authorized dealer.

d. Original copy of complete brochure mentioning the technical specifications of the quoted unit must be supplied with the quotation.

e. List and contact details of users from Nationalized or reputed laboratories all over the India must be supplied with quotation.