Global tender notification for the procurement of "Electro Physiology (EP) System" at the Molecular Biophysics Unit (MBU), Indian Institute of Science, Bangalore

Last date of submission of tenders: 25 November 2022

(TENDER FROM FOREIGN VENDORS)

Dear Sir/Madam, October 26, 2022

Subject: Electro Physiology (EP) System for research laboratory use

This is a Request for Quote (RFQ) from Foreign/International Original Equipment Manufacturer (OEM) or their Indian authorized distributor for the supply of "**Electro Physiology (EP) System**" as a part of a tender for research use at the Molecular Biophysics Unit, the Indian Institute of Science.

The global tender comes without GTE approval since, the equipment is exempted from GTE approval process vide the government order, OM No.F. 4/ 1/ 2021 dated 06.01.2022 which provides relaxation on global tender enquiry (GTE) under rule 161(iv) of General Financial Rules (GFRs) 2017 for procurement of medical devices. The Electro Physiology (EP) System is an exempted item under this rule.

Please send your quotation valid for a period of at least 60 days from the last date for submission of quotes for the supply of equipment described below. Your quotation should clearly indicate the terms and conditions of the quotations, delivery schedule, entry tax, payment terms, warranty coverage, etc. The tender should be submitted in two separate sealed envelopes – one containing the "Technical Bid" and the other containing the "Commercial bid", both of which should be duly signed and must reach the undersigned on or before **17:00 hours of 25 November 2022**.

Technical bid should be exactly the same as commercial bid except that prices are not shown in technical bid. Technical bids should have item-wise compliance reports of all specifications. The technical specification of the Electro Physiology (EP) System has multiple components/parts. Part-A, Part-B, Part-C, etc. Each part corresponds to different components of the Electro Physiology (EP) system. Part-A; corresponds to the amplifier, digidata, and its compatible software with a supported computer system. Part-B; corresponds to the upright IR-DIC microscope suitable for brain slice patch clamping, a supported camera, software, and a suitable computer. Part-C; corresponds to the precision motorized manipulators, stage, translator and horizontal patch-clamp

pipette puller. Part-D; corresponds to the internal perfusion system. Part-E; corresponds to the temperature controller, bath chamber, and perfusion system. Part-F; corresponds to the current and voltage stimulator. Part-G; corresponds to the vibratome. Part-H; corresponds to the noise-free antivibration table. The quotes should be for all the components of any one part or multiple parts of the Electro Physiology (EP) System with separate enveloped technical and commercial bids for each part. The commercial bid should have pricing for each of the items quoted in the technical bid. Prices quoted should be inclusive of all appropriate taxes/duties. The prices quoted should be inclusive of delivery of the items to the site and installation at the site. Prices should be quoted in INR, EURO, and/or US dollars.

Technical specifications for different parts of the Electro Physiology (EP) System, are given below:

Electro Physiology (EP) System - Part-A

1. Computer-Controlled Patch-Clamp Amplifier: Quantity-1 (One)

1.1. A patch clamp amplifier capable of acquiring whole cell and single channel currents.

1.2. Amplifier must be software controlled for optimization features, reduction of manipulation steps, and should be convenient for use in electrophysiological brain slice and dissociated neuronal preparations.

1.3. It should have reliable automatic telegraphing.

1.4. Quick select feature should recall up to three saved amplifier configurations for fast, reproducible application switching.

1.5. Should have optional Software Panel which allows amplifier control using knobs and buttons for a more conventional feel to amplifier control.

1.6. Integrated seal test in voltage- and current-clamp mode for easy monitoring of membrane and cell parameters.

1.7. Dual command potentials that can add flexibility by processing input signals from two different sources.

1.8. Selectable command sensitivity for flexible control of the output waveform.

1.9. Pipette offset compensation with auto-mode which can quickly remove signal offsets.

1.10. Automatic pipette capacitance compensation which requires only the push of a button to neutralize the contribution of the glass pipette and the pipette holder to the capacitance of the circuitry.

1.11. It should have auto-series resistance compensation: Prediction should help achieve the desired command level faster by transiently supercharging the membrane potential.

1.12. Series resistance compensation: Correction should improve the bandwidth of the recording by eliminating the error introduced by the voltage drop across the series resistance.

1.13. Automatic capacitance compensation function should correct the aberrations introduced by the capacitance of the cell membrane, and glass pipettes in whole-cell and single-channel recordings with a single mouse click.

1.14. Automatic mode switching should enable to control the transition between voltage and current clamp by an external trigger or depending on the recorded signal.

1.15. Automatic oscillation detection should prevent damage to a cell when electrical feedback occurs.

1.16. It should have auto leak subtraction for the correction of leak currents with a smart, software-based algorithm.

1.17. Selectable output gain function to scale the output signal to the desired level.

1.18. Audio monitor for acoustic tracking of the signal while you are busy looking down a microscope.

1.19. Fine-tunable 4-pole Bessel and Butterworth low-pass filters that can act as anti-aliasing filters and can be used to pre-condition the output signal.

1.20. Support of up to two head stages that can make the system two amplifiers in one.

1.21. Head stages (with mounting plates). Bath-, Patch-, and cell - configuration, bilayer model cell.

1.22. USB cable

1.23. Theory and operation user guide.

1.24. Auxiliary head stages for voltage recording and for virtual ground or bath clamp

1.25. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

1.26. It should be supplied with a minimum of a 1-year warranty period after installation.

2. <u>Digitizer (Low Noise Data Acquisition System): Quantity-1 (One)</u>

2.1. The system should have up to four channels that can eliminate 50/60 Hz line-frequency noise and associated high frequency harmonics in less than one second and with a single click

2.2. Should digitize a wide range of input signals from -10 to +10 V.

2.3. Should eliminate a maximum noise amplitude of up to 20 V, peak-to-peak.

2.4. 8 analog input channels to digitize acquired signals up to 500 kHz independently.

2.5. 8 analog output channels to send command voltage output independently.

2.6. 8 digital out channels to control the periphery equipment used in sophisticated experiments.

2.7. Independent analog-to-digital converters for each input channel ensure low crosstalk levels and high data acquisition rates.

2.8. State-of-the-art signal-to-noise ratio.

2.9. Low Noise data acquisition System with silencing/elimination of hum which can learn and remove local line-frequency noise patterns and associated high-frequency harmonics from incoming signals in less than one second.

2.10. A minimum of 4 channels supporting the hum silencing and should be capable of removing the local line-frequency.

2.11. With a single click, line-frequency noise is subtracted from the incoming signal during data acquisition.

2.12. All signal connectors on the front panel for ease of access and maintenance of the electrophysiology set-up.

2.13. User guide written by scientific consultants, with the assistance of trained staff, for straight forward start-up and as an in-depth reference.

2.14. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

2.15. It should be supplied with a minimum of a 1-year warranty period after installation.

3. <u>Standard Electrophysiology Software: Quantity-2 (two)</u>

3.1. Membrane test should support monitoring cell health between sweeps during a recording.

3.2. Membrane and seal tests should be combined into a single resizable window.

3.3. Support for up to eight stimulus waveforms.

3.4. Control of eight digital outputs.

3.5. Control of split-clock sampling per epoch during a sweep.

3.6. Leak subtraction should automatically save both raw and corrected traces.

3.7. All protocol durations should be entered in time units.

3.8. Should have the ability to automate the execution of protocols with sequencing keys, a variety of recording modes from Gap-Free to Episodic Waveform stimulation, online

filtering and leak subtraction, as well as online statistics and support of automatic quick graphs.

3.9. Software should provide a convenient way to produce background recordings.

3.10. Should be able to monitor cells during inter-sweep periods, or create an overview of the entire day's activities including voice tags.

3.11. The applications capable to acquire data concurrently on the same computer.

3.12. Capable of analyzing, graphing, and formatting of all data.

3.13. Should include an extensive array of filtering and fitting routines.

3.14. Functionality should include l-V graphs, power spectrums, and special "linked data views" for threshold (Action Potential), template (minis), and single-channel modes of event detection and analysis.

3.15. The software should support offline/remote analysis in isolated computers without requiring acquisition/analysis dongles or restrictions. If remote analysis of the acquired data on separate computers requires licensed dongles then at least 4 (four) additional analysis dongles should be provided along with the above two quantities mentioned.

4. <u>Windows Computer: Quantity-1 (one)</u>

4.1. For installation of the patch clamp recording and analysis software a branded desktop computer with latest and best configuration with original windows and Microsoft office professional with life time validity is essential.

4.2. The computer should have Windows 10 Pro-64 bit

4.3. CPU should be with i7 processor or above

4.4. 16 GB RAM or above

4.5. Display size of the monitor should be 26 inches or above with 3D graphics

4.6. It should have a minimum SSD Hard disks of 500 MB.

4.7. It should have a SATA hard drive minimum of 2 TB.

4.8. Minimum of 1 USB3 ports and a Minimum of 4 (four) USB2 ports

4.9. It should come with a UPS for smooth running the electrophysiology set up.

4.10. One set of compatible Keyboard and Mouse.

4.11. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

4.12. It should be supplied with a minimum of a 1-year warranty period after installation.

Electro Physiology (EP) System - Part-B

1. Upright Microscope For Brain Slice Electrophysiology Setup: Quantity-1 (One)

1.1. The microscope body should be an upright Microscope with 4 position nose piece or more,

1.2. It should be with the IR-DIC and Dodt gradient contrast capabilities.

1.3. The microscope body should also be upgradeable to micromanipulation.

1.4. The upper microscope part should be with a mount for reflected-light illumination man. P&C or reflected-light illumination.

1.5. The lower microscope part should be with objective focusing with a 15 mm focus lifting range or better.

1.6. The lower microscope part should have an adapter for objective mount.

1.7. The lower microscope part should have transmitted light illumination with luminous field diaphragm and switchable diffusion disk.

1.8. The lower microscope part should support mounting for Dodt contrast slider/module.

1.9. It should come with a heat-protection filter/ filter for IR BP 750-990 and for IR contrast method used alternately.

1.10. It should have 6-position filter turret for the supported filters.

1.11. The binocular phototube should have 20° adjustable with FOV 23 or better.

1.12. It should have camera attachment with light distribution of (100:0/0:100).

1.13. It should be supported with sliding prism and a low-vibration prism switch.

1.14. It should be offered with a camera port with c mount.

1.15. The objective turret should have 4 changeable positions or more.

1.16. The microscope should be supplied with the following objectives:

1.16.1. **10x**: Semi PlanApochromat/ Plan-Neofluar 10x/0.3WD=5.2mm or better

1.16.2. **40x**: Water immersion Objective Plan-Apochromat 40x/1.0 DIC FWD=2.5mm V IS-IR or better.

1.16.3. **60/63x**: Water immersion Objective Plan-Apochromat (60x or 63x)/1.0 M27 (FWD=2.1mm), VIS-IR or better.

1.16.4. **100x**: Objective Semi Plan Apochromat/ Plan-Neofluar 100x/1.3WD=0.20mm or better

1.16.5. 40x and 63x magnification should be supported by DIC and IR-DIC.

1.17. The microscope should be with an achromatic-aplanatic condenser of 0.9 NA with 5-position modulator disk or better.

1.18. The condenser should be with 3 mounts for DIC prisms or better.

1.19. The condenser should be with a rotary stop for inclined illumination for objectives 10x-100x or better.

1.20. The condenser should have suitable accessories for Dodt gradient contrast.

1.21. Suitable Polarizer and analyzers, filters, and sliders (750-790 nm) should be quoted for IR-DIC and Dodt gradient contrast.

1.22. The transmitted light should have 12V/100 W Halogen lamphouse with illuminator and quartz collector

1.23. The reflected light should be provided with 120W or better Metal Halide lamp attached with light guide and suitable filters attenuators.

1.24. The life time of the reflected light lamp should of minimum 2000 hrs or better.

1.25. The microscope should have a minimum of five-position reflector turret.

1.26. The fluorescence filters should be shift free or better.

1.27. The microscope should be supplied with reflected filters with appropriate fluorescence filters with the following specifications.

1.27.1. **DAPI Filter Set**: EX G 365, BS 395, EM BP 445/50

1.27.2. **GFP Filter Set**: EX BP 470/40, BS 495, EM BP 525/50

1.27.3. **RFP Filter Set**: EX BP 545/25, BS 570, EM BP 605/70

1.27.4. Empty reflected filter cubes should also be provided for future integration.

1.28. The microscope should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

1.29. It should be supplied with a minimum of a 1-year warranty period after installation.

2. <u>IR-DIC suitable camera and supporting software: Quantity-1 (One)</u>

2.1. The microscope should be provided with a monochromatic camera.

2.2. Camera should be supported by suitable C mount adapter (1x or 0.63x).

2.3. The camera should be 5.00 megapixel with a resolution 2464 (H) x 2056 (V) or better.

2.4. The camera should be with a minimum sensor size diagonal 11.1 mm or better.

2.5. It should have a minimum pixel size of 3.45 µm x 3.45 µm or better.

2.6. The camera should have high peak quantum efficiency of up to 70% or better

2.7. The camera should support a full resolution frame rate @60 fps or better.

2.8. The camera should have spectral sensitivity from 350nm -1000nm or better.

2.9. The camera should be with a full well capacity of 11000e at 1x gain or better.

2.10. The camera should have an active thermoelectric cooling mechanism.

2.11. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

2.12. It should be supplied with a minimum of a 1-year warranty period after installation.

2.13. The camera should be supplied with suitable software for acquisition and annotation.

2.14. The software and camera should support live cell imaging, time-lapse imaging, automatic detection of basic tools, ROI analysis, and physiological analysis.

2.15. The license of the software should be for a lifetime.

3. <u>Windows Computer: Quantity-1</u>

3.1. For installation of the imaging software, a branded desktop computer with the latest and best configuration with original windows and Microsoft office professional with lifetime validity should be provided.

3.2. The computer should have Windows 10 Pro-64 bit or the latest version.

3.3. CPU should be with i7 processor or above.

3.4. 16 GB RAM or above.

3.5. Display size of the monitor should be 26 inches or above with 3D graphics.

3.6. It should have a minimum SSD Hard disks of 500 MB.

3.7. It should have a SATA hard drive minimum of 2 TB.

3.8. It should have a minimum of 1 USB3 ports and minimum of 4 (four) USB2 ports.

3.9. It should come with a UPS for smooth conduct of the imaging.

3.10. One set of compatible Keyboard and Mouse.

3.11. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

3.12. It should be supplied with a minimum of a 1-year warranty period after installation.

Electro Physiology (EP) System - Part-C

1. High Precision Motorized Manipulator System: Quantity-2

1.1. A single patch clamp controller capable of running 2 manipulators for precision electrophysiological studies.

1.2. Out of two manipulators, one can be left and one can be right orientation.

1.3. It should have software for pipette tracking for easy multi-pipette placement & location.

1.4. It should come with control cube or touchpad control for operating the manipulator.

1.5. The electronics should be optimized for single channel recording having low noise.

1.6. Should be easily configurable for virtual 4th axis set without computer interface.

1.7. It should have accelerated mode for fast, manual manipulator movement and should have fine movement options.

1.8. There should be easy selection of different modes (speed/res, pulse, and Acceleration)

1.9. It should display of X, Y, Z coordinates, Mode, active manipulator for easy understanding.

1.10. X,Y,Z motorized movement distance in each axis should be a minimum of 25 mm or more.

1.11. It should have automatic Home and Work Position moves features for easy automated pipette exchange.

1.12. Drive Mechanism should be a Precision worm gear Capstan drive or Crossed Roller Bearing type.

1.13. Resolution of 20 nm or better.

1.14. It should support a maximum speed of 3 mm per second or less and a minimum speed of 1 μm per second or better.

1.15. Long Term Stability of the Drive Mechanism should be less than 1 micron in 3-4 Hours or for longer duration.

1.16. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

1.17. It should be supplied with a minimum of a 1-year warranty period after installation.

2. Fixed Anodized Aluminium stage: Quantity-1

2.1. A large rigid platform standing on height adjustable gantry stands/Legs.

2.2. It should support multiple manipulators of 2-4.

2.3. It should have holes spaced at 25 mm for placing the manipulators.

2.4. It should withstand a load of >30Kgs.

3. Manual X-Y Translator for: Quantity-1

3.1. One X-Y Translator that can support an upright microscope unit attached with patch clamp manipulators and other accessories.

3.2. It should have 25 mm or better X-Y travel length., Step Size 20nm, Speed 0.1µm per second, and Maximum Speed 4mm per second

3.3. It should have a 4-5 µm resolution and support 30 Kg or better load capacity

4. Horizontal Patch-Clamp Micropipette Puller: Quantity-1

4.1. A filament based horizontal micropipette puller which should pull two symmetrical usable pipettes from each pull.

4.2. It should have touch screen display with inbuilt pipette program techniques.

4.3. It should have safe heat mode to protect /extend filament life.

4.4. It must have jaw temperature sensor to define pulling conditions.

4.5. It should be consistent and reliable in pulling micropipettes with tip diameter of 0.1-0.125 µm.

4.6. It should have line repeat mode that simplifies multi-line programming with 4-8 lines.

4.7. Capable of pulling Aluminosilicate and Borosilicate glass capillaries.

4.8. It should have environmental chamber for humidity control and programmable air pressure.

4.9. Should be available with both time and pulse cooling modes.

4.10. It must be able to perform glass melting point test when new filament or glass introduced.

4.11. Self-contained air supply with filtration system and control over the time and pressure at which the air is delivered.

4.12. It should have memory storage for storing 90-100 programs and program results.

4.13. Should be able to pull up to 3.5-4 mm outer diameter glass pipette.

4.14. Tip size achievable should be in the range of 0.06µm - 3µm.

4.15. Max taper length achievable should be of 2 cm.

4.16. Accessory borosilicate glass pipettes of outer diameter 1.5 mm and inner diameter of 0.86 mm (40 boxes) and 1.1 mm (10 boxes).

4.17. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

4.18. It should be supplied with a minimum of a 1-year warranty period after installation.

Electro Physiology (EP) System - Part-D

1. Patch Pipette Internal Perfusion System: Quantity-1.

1.1. Patch Pipette Perfusion System to perfuse patch pipettes during whole-cell and single channel recording.

1.2. It should be able to internally perfuse cells during whole-cell and single-channel recordings for pharmacological and second-messenger studies of ion channel function.

1.3. Able to perform both whole-cell pipette perfusion with positive pressure and patch perfusion using negative pressure.

1.4. Specific Perfusion pipette holder suitable for performing internal perfusion of the pipette solution.

1.5. Pressure and vacuum controller to balance pressure on patch while driving fluid flow.

1.6. Quartz capillary tube for optimal noise reduction and durability for proximal positioning to pipette tip.

1.7. It should not produce electrical noise during recordings.

1.8. Precise control of pressure and vacuum is a must to prevent cell damage.

1.9. Cell perfusion to work from seconds to minutes continuously.

1.10. Should facilitate the acquisition of dose response curves and wash-in/wash-out experiments performed inside the recording pipette.

1.11. It should have input range: 15PSI Min. / 50PSI Max or better.

1.12. Output range: +/- 30-40 mmHg or better.

1.13. Accuracy: +/- 0.1 - 0.2 mmHg or better.

1.14. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

1.15. It should be supplied with a minimum of a 1-year warranty period after installation.

Electro Physiology (EP) System - Part-E

1. Dual Channel Temperature Controller: Quantity-1

1.1. The temperature controller will be used for brain slice patch clamp measurements that require a quiet and very less thermal noise generation.

1.2. It should support dual temperature control.

1.3. It should have slow ramped DC power for quiet operation

1.4. It should support temperature control from ambient to +65°C or better.

1.5. It should have manually controlled DC output choices.

1.6. It should come with three feedback loop speeds or better.

1.7. It should support independent temperature monitoring.

1.8. It should be compatible with an external input for computer control.

1.9. It should have open thermistor fault protection to prevent overheating of the sample.

1.10. Interface cables and thermistors for connecting temperature controllers to products must be provided.

1.11. In line solution heat for the heater, controller should also be provided.

1.12. Cable assembly/heat controllers should also be supplied.

1.13. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

1.14. It should be supplied with a minimum of a 1-year warranty period after installation.

2. Computer Controlled External Gravity Perfusion System: Quantity-1

2.1. A pinch valve perfusion system with 6 or channel outputs.

2.2. It should be valve controlled gravity perfusion system for patch clamp recording and/or imaging applications.

2.3. Electronic control of solution exchange with low-maintenance pinch valves should be used.

2.4. Should be suitable for long-term perfusion experiments with a response time (Valve Opening Speed) of 20-30 ms or better.

2.5. Should be suitable for sensitive undisturbed electrophysiological recordings with minimum electronic noise.

2.6. Should have customizable reservoir sizes and materials and should be supplied with 50-60 mL Luer lock syringes along with the basic unit

2.7. Valve open and close time stamps feature via analog or digital output.

2.8. 6-8 channel perfusion outlet manifold should be supplied as standard that is compatible with the perfusion system.

2.9. Additional 2- and 4-fold manifolds should also be supplied.

2.10. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

2.11. It should be supplied with a minimum of a 1-year warranty period after installation.

3. <u>Chamber heating platform for brain slice electrophysiology: Quantity-1</u>

3.1. A microscope stage chamber suitable for brain slice patch clamp recording experiments with the up-right microscope setup that supports temperature ranges from 15-50°C.

3.2. It should be of magnetic stainless steel material.

3.3. The thermoster should be of 20 kΩhm Power Resistors or batter.

3.4. The chamber heating platform should support and be compatible with the bath recording chamber mentioned below.

3.5. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

3.6. It should be supplied with a minimum of a 1-year warranty period after installation.

4. <u>Bath Recording Chamber: Quantity-1</u>

4.1. The bath recording chamber should be of polycarbonate material that supports temp ranges from 15-50°C.

4.2. This should be a low-profile bath recording chamber.

4.3. The recording chamber should support 170-200 ul of bath buffer.

4.4. The dimensions of the chamber should be 24 mm length, 15 mm width, and 2 mm height.

4.5. It should be supplied with a slice anchor kit for supporting the brain slices.

4.6. Two number packages of 50 cover glasses (total of 100 cover glasses) of dimension 22 X 40 mm, that are compatible with the recording chamber should be provided.

4.7. Tubing sets that are required for connecting the external gravity perfusion system (Part-E.2) with batch recording chamber should be provided.

Electro Physiology (EP) System - Part-F

1. Isolated Stimulator for Brain Slice Recording: Quantity-1

1.1. The stimulator should be able to perform constant current and voltage generation.

1.2. It should have an easy-to-use front panel interface featuring simple lever wheel switches for all timing functions.

1.3. It should have excellent timing accuracy: < 0.02%.

1.4. It should support output current up to ±10 mA or batter.

1.5. It should support output voltage up to ±100 V or batter.

1.6. It should have an optical isolator coupled output control.

1.7. It should support mono- or biphasic pulse outputs.

1.8. It should support Free-run, Manual, or External triggering.

1.9. It should have status lights indicate operational state and setup/control errors.

1.10. It shouldn't require a battery for its operation.

1.11. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

1.12. It should be supplied with a minimum of a 1-year warranty period after installation.

Electro Physiology (EP) System - Part-G

1. Fully Motorized Vibrating Microtome: Quantity 1

1.1. Motorized vibrating blade microtome capable of sectioning fixed and unfixed specimens.

1.2. Motorized Vibrating Microtome should have a sectioning frequency 80-85 Hz (± 10 %).

1.3. It should have an amplitude from 0-3 mm, in increments of 0.05 - 0.075 mm.

1.4. Motorized Vibrating Microtome should have a sectioning speed 0.01 - 1.5 mm/s.

1.5. The vibratome should have a return speed from 1.0 - 5 mm/s, with 0.5 – 0.075 mm/s.

1.6. The vibratome should have a motorized total vertical specimen stroke of 15 - 20 mm.

1.7. Motorized Vibrating Microtome should have a sectioning range of 40 - 45 mm.

1.8. Motorized Vibrating Microtome should have a sectioning window from 0.5 mm - 45 mm

1.9. Motorized Vibrating Microtome should have specimen retraction from 0 - 100 µm which should be adjustable and can be deactivated on demand.

1.10. Motorized Vibrating Microtome should have a blade holder turnable by 90° for safe blade insertion of the whole razor-injector.

1.11. Motorized Vibrating Microtome should have a blade holder with clearance angle adjustment from 15 – 21º and should have an optimized blade holder design for minimized buffer spillage.

1.12. The vibratome should have fully motorized cutting two modes single and continuous mode.

1.13. It should have a selection between semi-motorized and fully automatic cutting modes.

1.14. Motorized Vibrating Microtome should have specimen orientation with 360° rotating.

1.15. Motorized Vibrating Microtome should have a revolving specimen plate from 0 - 10°.

1.16. Motorized Vibrating Microtome should have a sectioning thickness setting for manual operations in 0.9 - 1 µm increments and for automatic operations maximum 1000 µm.

1.17. It should be supplied with a foil protected external control panel for user operations.

1.18. Motorized Vibrating Microtome should be supplied with a plastic buffer tray consisting of lid, non-orienting specimen disc, tube clamp, the volume capacity of 100 - 125 ml and should be autoclavable.

1.19. Motorized Vibrating Microtome should be supplied with metal buffer trays consisting of lid, non-orienting specimen disc, tube clamp, volume capacity of 100 - 125 ml and should be autoclavable – 2 quantities.

1.20. Motorized Vibrating Microtome should be supplied with black non-orienting specimen discs of 18 - 20mm, aluminum black painted, powder coated, 360° rotatable, with buffer tray by a magnet – 2 quantities.

1.21. Motorized Vibrating Microtome should have a maximum specimen size with standard blade holders of 33 x 50 mm – 2 quantities.

1.22. Motorized Vibrating Microtome should be supplied with vibrocheck for measurement devices for vertical deflection of the blade.

1.23. Motorized Vibrating Microtome should be supplied with a 2X magnifier and foot switch.

1.24. Motorized Vibrating Microtome should be supplied with cold light with swan necks for adjustments of light.

1.25. It should be compatible with 220 volts (+/- 10%) 50/60 Hz line power.

1.26. It should be supplied with a minimum of a 1-year warranty period after installation.

Electro Physiology (EP) System - Part-H

1. Vibration Isolation Table/Workstation: Quantity-1

1.1. The length of table/workstation should be 1200 mm / 4 feet.

1.2. The width of the table should be 900 mm / 3 feet.

1.3. It should be supplied with 50 mm thick honeycomb table top.

1.4. It should have a load capacity of 350-450 lbs or batter.

1.5. It should have the negative stiffness isolation mechanism.

1.6. It should support ultra-low frequency vibration isolation with spring-activated technology.

1.7. For vibration isolation natural frequency the workstation should achieve more than 90% or better isolation efficiency at 2 Hz, and 95% or better efficiency at 5 Hz, and at 10 Hz.

1.8. It should be supplied with a minimum of a 1-year warranty period after installation.

Important: Please note that the technical specifications of individual parts of the "Electro Physiology (EP) System should match all listed above.

The documents may be addressed to the Chairman, Molecular Biophysics Unit (Kind attention: Dr. Giriraj Sahu), Indian Institute of Science, Bangalore 560012. The last date for receiving queries is **10 November 2022.** The last date for submission of bids is **25 November 2022**.

Thank You.
Sincerely,

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