VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY: BURLA

P.O: Engineering College Burla (Siddhi Vihar), Dist: Sambalpur
Odisha– 768018, India
Website :www.vssut.ac.in, E-mail: registrar@vssut.ac.in,Ph:(0663)2430573,Fax-2430592

No.: VSSUT/EE/ 804 /2026 **Date: 14 / 10 /2026**

TENDER CALL NOTICE

Sealed bids, in two separate covers (Technical bid and Financial bid) are invited from original manufacturers / authorized suppliers/ authorized dealers for the supply, installation, commissioning, Maintenance and demonstration of various equipment for **Advanced Renewable Energy Systems Laboratory (ARESL): Machines, Magnetics & Converter** for the **Dept. of Electrical Engineering**", VSSUT, Burla, Sambalpur, Odisha, under FIST Project funded by DST, Govt. of India (GoI).The tenders shall reach the office of the undersigned through **Speed/Registered** post /Courier services only **on or before 06/11/2026 up to 4.30PM**.
For more details, please visit our university website www.vssut.ac.in. The authority the reserve right to accept or reject all the tenders without assigning any reason thereof.

REGISTRAR

Size: 8 × 6 Sqcm

Memo No. VSSUT/EE/ 805 /2026 **Date: 14 / 10 /2026**

Copy to:-

1. The Director, Department of I & PR, Govt. of Odisha, Bhubaneswar with request to publish above advertisement in one issue of the All Odisha daily edition of "The Samaja" and All India edition of "The New Indian Express + Indian Express" at the I&PR approved/lowest rate. The bill may be sent in triplicate along with a copy of the paper in which the publication is made.
2. University Notice Board of VSSUT, Burla.
3. Comptroller of Finance for information and necessary action.
4. Dean F & P, with a request to upload the notice &documents in the university website.
5. PA to Vice Chancellor for information of the Honorable Vice Chancellor.

REGISTRAR
VSSUT, Burla

VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY: BURLA

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No: VSSUT/EE/ /2026 **Date: / /2026**

TENDER CALL NOTICE

Sealed Bids, in two separate covers **(Technical Bid and Financial Bid)** are invited by the **"The Registrar, Veer Surendra Sai University of Technology, Odisha"** from original manufacturers/authorized suppliers/authorized dealers **for Supply, Installation, Commissioning, Maintenance and Demonstration of Advanced Renewable Energy Systems Laboratory (ARESL) : Machines, Magnetics & Converter** equipment for the **Department of Electrical Engineering (EE), VSSUT Burla, Odisha** under FIST(Fund for Improvement of Science & Technology) project funded by Department of Science and Technology(DST), Govt. of India. The sealed quotations shall reach the undersigned by regd. / speed post / Courier services within the office hour by **4.30 P.M.** of date **06/11/2026**. Tender received beyond this date & time shall be rejected. **"Tender for Electrical Engg. Department. for supply of Advanced Renewable Energy Systems Laboratory (ARESL): Machines, Magnetics &Converter equipment"** must be super scribed on the sealed envelope. The details of the equipment/ firmware/Software and their technical specifications are mentioned below.

Details of the Equipment/Firmware

Table No.1: Detail Specifications of Equipment

Sl. No	Item &Description	Quantity	Specifications
1	**3.7kW, 240V BLDC Generator coupled with 7.5hp, 415V 3-Phase IM.**	1	3.7 kW Brushless DC (BLDC) Generator directly coupled to a 5.5 kW (7.5 hp) Three-Phase Induction Motor(IM). The assembly must be fully integrated on a common structural steel bedplate with vibration isolation, safety guarding, and high-resolution feedback instrumentation. **Technical Specifications** 1. **Component A:Research-Grade Three-Phase BLDC Generator of 3.7 kW** (5 hp mechanical input equivalent), Rated Voltage: 240 V AC (Line-to-Line, RMS) at rated speed. Magnetic Profile & Waveform: 4-Pole, permanent magnet rotor optimized to generate a highly stable trapezoidal back-EMF / terminal voltage waveform from no-load to full-load conditions. Phase Balance: Must deliver a strictly balanced three-phase output voltage profile across all operating ranges. Stator Connection: Star (Y) connected with the Neutral point brought out explicitly to an external 40 A terminal box. Electrical Frequency: Designed for a nominal fundamental frequency of 50 Hz at a rated synchronous speed of 1500 RPM. Voltage Regulation: Tight

			armature/field design to restrict the total voltage drop from absolute no-load to full rated load within research tolerances. **2. Component B: Three-Phase Prime Mover (Induction Motor):** Rated Output Power: 5.5 kW (7.5 hp), Rated Input Voltage & Frequency: 415 V (Line-to-Line), 3-Phase, 50 Hz, Squirrel Cage type, Delta (Δ) connected stator winding, 4-Pole design (nominal operational speed ~1440–1470 RPM under load), Thermal Documentation: A 24-hour temperature-rise test report conducted at full rated load prior to dispatch. Mechanical Coupling, Thermal Management, & Auxiliaries: Shaft Coupling: Torsionally flexible Tyre-type or Jaw-type coupling precisely aligned, Duty Cycle Rating: Continuous Duty Thermal Insulation: Class F insulation system utilized and temperature rises limited to Class B limits, With Cooling System, Speed & Position Feedback Encoder: High-accuracy, optical or magnetic incremental rotary encoder providing a resolution of 1024 Pulses Per Revolution (PPR). Rigid Foundation Base: Heavy-gauge fabricated structural steel base plate for precise motor-to-generator alignment with appropriate anti-vibration pads/mounts Safety Guarding of coupling.
2	**3.7kW, 240V Three Phase Induction Machine coupled with 7.5hp Three Phase,415V IM and Three Phase 415V, 10 HP VFD**	1	3.7kW, 240V Three Phase Induction Machine coupled with 7.5hp Three Phase,415V Induction Motor(IM) and Three Phase 415V, 10 HP Variable Frequency Drive(VFD). The assembly must be fully integrated on a common structural steel bedplate with vibration isolation, safety guarding, and high-resolution feedback instrumentation. **Technical Specifications** **1.Component A:3.7 kW (5 hp). Induction Machine** (Operating as Generator), 240 V AC (Line-to-Line), 3-Phase, Star (Y) connected with the Neutral point brought out explicitly to a heavy-duty, 40 A external terminal box with oversized neutral terminal rated for 100% phase current to safely withstand triplen harmonic heating, Squirrel Cage rotor, 4-Pole, Rotor core built with high-retentivity silicon steel laminations. Self-Excited Mode: Must maintain a stable, balanced, sinusoidal three-phase voltage and current profile from no-load up to full rated load, Total Harmonic Distortion (THD): less than 5%, fully compliant with IEEE 519 standards, • Voltage Regulation: Maximum terminal voltage drop limited to 10% to 15% from no-load to full-load using external passive/active compensation. Excitation Characteristics: Must exhibit rapid, stable voltage build-up/boosting, saturating cleanly at the rated voltage without wave distortion or voltage hunting. Rotor core steel processed to ensure reliable residual magnetism sufficient to initiate passive capacitor self-excitation. The machine must be mechanically and electrically capable of sustained over-speed testing up to 1650 RPM or more. With factory test certificates containing complete No-Load and Blocked-Rotor test data. **2.Component B:Prime Mover (Three-Phase Induction Motor of 5.5 kW (7.5 hp)**, 415 V AC (Line-to-Line), Delta connected, Squirrel Cage, 4-Pole configuration operating with rated Input voltage: 3-Phase, 50 Hz,Inverter-Duty rated to withstand high dv/dt voltage spikes from the VFD, designed with a low-inertia rotor to optimize dynamic turbine emulation.capable of handling a breakdown torque of 200% to 250% of rated torque. Housed in a standard indoor IP20 terminal framework box to support proper Delta integration, and embedded with three PTC thermistors or PT100 RTD sensors (one per phase) for winding thermal protection interlocking. **3.Component C: High-Performance Variable Frequency Drive (VFD)** 7.5 kW (10 hp), 415 V AC, 3-Phase input with ±10% tolerance, optimized with a heavy-duty overload rating of a minimum 150% current for 60 seconds to seamlessly handle transient step-loading in motor-generator testing. Must support stable, continuous operation across an output frequency range from 0.5 Hz up to 60 Hz. Control Modes: Selectable open-loop Sensorless Vector

			Control (SVC) and programmable multi-point V/f curves, optimized for high-performance Constant Torque operating regions. Integrated Hardware: Equipped with an integrated internal dynamic braking chopper unit matched to an external dynamic braking resistor housed in a ventilated cage, rated for a minimum of 10% continuous braking duty cycle to safely dissipate regenerative energy during deceleration testing. Interface & Control: Integrated or removable alphanumeric digital keypad display for local programming and monitoring of basic parameters (Current, Voltage, Frequency). Dual speed reference capability: Local manual control (Keypad/Potentiometer) and an External isolated 0 to 10 V DC Analog input channel dedicated to receiving real-time remote speed/frequency tracking commands from external High-Performance Real-Time Processor System for Rapid Control Prototyping (RCP) and Hardware-in-the-Loop (HIL) Applications. Includes programmable digital inputs for remote operational commands (Start, Stop, Fault Reset) and digital/relay outputs for drive status indication back to the processor. Enclosure & Physical Layout: Wall-mountable industrial enclosure panel providing a standard IP20 protection rating with pre-wired, clearly labeled terminal blocks cleanly segregating power inputs, motor lines, braking loops, and low-voltage control/sensor signaling. Quality Assurance & Documentation: Vendor must supply standard Factory Test Reports validating basic rated performance parameters prior to dispatch.
3	**3.7kW, 240V three phase PMSG coupled with 7.5hp, 415V IM, 10hp 415 V VFD with display and control in drives.**	1	3.7kW, 240V three phase Permanent Magnet Synchronous Generator(PMSG) coupled with 7.5hp, 415V Induction Motor(IM), 10hp 415 V Variable Frequency Drive(VFD) with parameter observation display and control in drives. The assembly must be fully integrated on a common structural steel bedplate with vibration isolation, safety guarding, and high-resolution feedback instrumentation. **Technical Specifications** **1.Component A: Research-Grade Three-Phase PMSG** 3.7 kW continuous electrical output, Rated 3-phase 240 V AC (Line-to-Line) at rated speed. of 1500 RPM synchronous speed at 50 Hz. Stator Winding Configuration: All six (6) stator winding terminals must be brought out and clearly labeled in the terminal box(IP20) to allow external user-configurable Star (Y) or Delta connections, Full load current of approximately 11 A RMS at 0.8 power factor or greater at full rated load for Star winding connection. Terminal block hardware and internal wiring lugs must be rated for a minimum continuous line current of 20 A. Optimized rotor magnet arrangement utilizing high-energy NdFeB permanent magnets to deliver a strictly balanced, highly symmetrical, sinusoidal output voltage and current profile. THD: The voltage waveform must remain stable and virtually distortion-free up to full rated load, fully compliant with IEEE 519 limits for research accuracy. Voltage Regulation from No-load to full rated load must be within 10% to 15%. Mechanical & Enclosure Construction: Rugged Cast Iron frame, Single shaft extension on the drive end (DE) Low acoustic noise emission **2.Component B: Prime Mover (Three-Phase Induction Motor)** Three-Phase Induction Motor of 5.5 kW (7.5 hp) continuous output, 415 V AC (Line-to-Line), 3-Phase, 50 Hz. Rotor & Pole Configuration: Squirrel Cage rotor, 4-Pole (nominal full-load operating speed 1440–1470 RPM). Delta connected stator winding (with a 6-terminal block architecture brought out to an IP20 terminal box to support proper Delta integration), rated as an Inverter-Duty motor fully compliant to withstand high dv/dt voltage spikes from the VFD, designed with a low-inertia rotor. **3.Component C:Mechanical Coupling, Thermal Management, &**

			Instrumentation Shaft Coupling: Torsionally resilient, high-alignment Tyre-type or Elastomeric Jaw-type coupling. Rated for Continuous Duty 24-hour operation under full-load conditions without thermal runaway. Class H insulation system with Class F temperature rise limits required for both machines, Cooling System: Integrated bi-directional internal shaft-mounted cooling fans on both machines, optimized alongside external frame cooling fins. Speed & Position Feedback Sensor: High-accuracy, industrial-grade incremental rotary Speed Encoder providing 1024 Pulses Per Revolution (PPR) , rigidly fixed at the Non-Drive End (NDE) of Induction Motor to feed closed-loop turbine emulation signals back to the VFD. Encoders must utilize differential line-driver signaling for EMI noise protection. Rigid Foundation & Safety Auxiliaries: Heavy-gauge fabricated structural steel common bedplate, anti-vibration mount pads, coupling guard/cover. **4.Component D:10 HP Variable Frequency Drive(VFD)** 7.5 kW (10 hp), 415 V AC, 3-Phase input with ±10% tolerance, optimized with a heavy-duty overload rating of a minimum 150% current for 60 seconds to seamlessly handle transient step-loading in motor-generator testing. Must support stable, continuous operation across an output frequency range from 0.5 Hz up to 60 Hz. Control Modes: Selectable open-loop Sensorless Vector Control (SVC) and programmable multi-point V/f curves, optimized for high-performance Constant Torque operating regions. Integrated Hardware: Equipped with an integrated internal dynamic braking chopper unit matched to an external dynamic braking resistor housed in a ventilated cage, rated for a minimum of 10% continuous braking duty cycle to safely dissipate regenerative energy during deceleration testing. Interface & Control: Integrated or removable alphanumeric digital keypad display for local programming and monitoring of basic parameters (Current, Voltage, Frequency). Dual speed reference capability: Local manual control (Keypad/Potentiometer) and an External isolated 0 to 10 V DC Analog input channel dedicated to receiving real-time remote speed/frequency tracking commands from external High-Performance Real-Time Processor System for Rapid Control Prototyping (RCP) and Hardware-in-the-Loop (HIL) Applications. Includes programmable digital inputs for remote operational commands (Start, Stop, Fault Reset) and digital/relay outputs for drive status indication back to the processor. Enclosure & Physical Layout: Wall-mountable industrial enclosure panel providing a standard IP20 protection rating with pre-wired, clearly labeled terminal blocks cleanly segregating power inputs, motor lines, braking loops, and low-voltage control/sensor signaling. Quality Assurance & Documentation: Vendor must supply standard Factory Test Reports validating basic rated performance parameters prior to dispatch.
4	**3.7kW, 240V three phase Micro Generator with Automatic Control system**	1	3.7kW, 240V three phase Micro Generator with Automatic Control system The assembly must be fully integrated on a common structural steel bedplate with vibration isolation, safety guarding, and high-resolution feedback instrumentation. **Technical Specifications** **1.Component A: Prime Mover & Generator Coupling:** Direct, inline mechanical coupling of a 6 kW minimum rated Diesel Engine to a 3.7 kW Brushless Synchronous Generator. Operating Duty: Rated for Continuous Duty capable of sustained full-load operation, delivering a stable, sinusoidal output under all loading states. Voltage THD not more than 5.0% up to full balanced load, verified by factory test reports. Housed entirely in a standard indoor IP20 framework layout. **2.Component B: Electrical Specifications (Generator & AVR)** 3.7 kW output capacity at 0.8 lagging power factor, 240 V AC Line-to-Line (L-L), 3-Phase, 4-Wire configuration, delivering 11 A continuous output at

			rated power factor. Excitation System: Brushless, self-excited utilizing a standard industrial Automatic Voltage Regulator (AVR) maintaining voltage regulation within ±1.0% from no-load to full-load. Stator Winding Pitch: Standard 2/3 (two-thirds) pitch design required to naturally suppress the 3rd harmonic and triplen harmonic currents. Insulation System: Class F minimum insulation with a Class B temperature rise limit. Terminal box layout must be IP20 rated with heavy-duty terminal blocks. **3.Component C: Mechanical Specifications (Diesel Engine & Governor)** Minimum 6.0 kW continuous shaft power output. Governor Type: Electronic Governor supporting Class A1 governing speed control standard (ISO 8528-5) to maintain tight frequency limits during load steps. Starting System: Standard 12V/24V DC electric key-start or push-button start mechanism, complete with a basic manual engine control module, integrated charging alternator, and a matched maintenance-free starter battery. Cooling System: Natural/forced-air cooling via high-efficiency internal cooling fans mounted directly onto the rotor shafts of both machines, complemented by frame cooling fins. **4.Component D: Instrumentation & Digital Interface** Rotary Speed 1024 Pulses Per Revolution (PPR) Encoder: High-accuracy, industrial-grade incremental rotary encoder mounted on the non-drive end of the shaft. Signal Output: Differential Line Driver outputs (RS-422 standard) to ensure high Electro-Magnetic Interference (EMI) noise immunity, pre-wired for direct external integration into the Real-Time Processor (RCP/HIL) system. **5.Component E: Structural, Foundation, & Safety Auxiliary Systems** Common Foundation Bedplate: Precision-machined, heavy-gauge fabricated structural steel common bedplate accommodating both the engine and the generator to prevent structural deflection. Vibration Isolation: High-damping elastomeric anti-vibration pads (AVMs), Coupling Assembly: Torsionally flexible, high-alignment Tyre-type or Jaw-type, Safety Guard with Interlock: High-visibility, removable steel safety coupling guard enclosing all rotating components. With safety interlock sensor.
5	**Three phase, 10kVA Multi tapping transformer**	1	10 kVA Custom Neutral-Compensation Multi-Tapping Transformer **1. Nominal Electrical Parameters Specifications:** Custom designed, Dry-Type, Multi-Tapping, Natural Air-Cooled (AN) Three-Phase Neutral Current Compensation Isolation Transformer. Nominal Rating: 10 kVA continuous duty, with a standard indoor IP20 protection configuration. **2.Winding & Vector Configuration:** Total of six (6) independent 200 V windings (exactly two matched windings per phase) providing a physical turns ratio of 1:1. Terminal connections must support external link strapping to execute a Delta-Star topology engineered specifically for zero-sequence neutral-current compensation on a 240 V Line-to-Line (L-L) system. Design must yield a low zero-sequence impedance of less than 5.0% to guarantee effective neutral current stabilization. **3. Magnetic Core & Core Materials:** Three-limb core topology with High-permeability, low-loss CRGO Silicon Steel, minimum grade M3 or better, lamination less than 0.27 mm, featuring high-integrity carlite or multi-layer inorganic surface insulation to suppress Eddy current losses. Core designed with high linearity to maintain working flux density under 1.35 Tesla (T) at nominal voltage, and below 1.50 Tesla (T) during 110% over-voltage transient profiles without core saturation. **4.Windings, Tappings, & Electrical Performance:** Conductor Material: High-conductivity, electrolytic-grade 99.9% pure Copper winding wire/strip, Insulation System: Class F minimum, Voltage Tapping Provisions: Each of the 6 independent windings must feature precise intermediate taps outputting: 140 V, 160 V, 180 V, 200 V, and 220 V. Waveform Integrity & Regulation to an ideal sinusoidal supply source, the induced voltage and current distortion

			factor to be less than 2%. **5.Physical Layout & Terminals**: Finished with heavy-duty, continuously rated 40 A to 63 A IP20-shielded terminal blocks explicitly featuring permanent RYB (Red-Yellow-Blue) color coding. Enclosure must be a floor-mounted, robust sheet-metal open-ventilated panel with a standard indoor IP20 rating, mounted on heavy-duty swivel castor wheels with independent foot brakes. Vendor must deliver a certified factory test sheet validating No-Load Core Losses (W), Full-Load Copper Losses (W) referenced at 75°C, and standard temperature-rise profiles showing compliance with Class F limits under continuous full load.
6	**Multi-tapping inductors**	1	**Multi-tapping inductors** **1. Nominal Electrical Parameters Specifications:** Custom-engineered, Dry-Type, Multi-Tapping, High-Linearity Three Phase Power Inductor or Single-Phase Power Inductor (3 numbers of Reactors). Nominal Electrical Parameters: 250 V AC working voltage, 40 A continuous RMS current rating at a fundamental frequency of 50 Hz. Winding Configuration: Single continuous multi-tap winding per phase execution, with taps at 0.125 mH, 0.25 mH, 0.5 mH, 1.0 mH, 2.0 mH, 2.5mH, 4.0 mH, 5.0 mH, 8.0 mH, 10.0 mH Inductance Tolerance: Operational inductance variance within ±5.0% for all specified range. **2. Magnetic Core Material & Gapping Specifications** Core Material Construction: High-permeability, low-loss CRGO Silicon Steel, Lamination Parameters: 0.27 mm and 0.30 mm thickness with insulation coating. Core Topology: Air-Gapped Core Design, Magnetic Flux Density Limits: 1.2 Tesla (T) at maximum voltage and current, Linearity Profile: Linear B-H curve with Zero magnetic saturation up to a 70 A peak current impulse. **3. Windings, Terminals, & Electrical Performance** Conductor Material: High-conductivity, electrolytic-grade 99.9% pure Copper winding, Insulation System: Class F minimum, Harmonic Waveform Integrity: voltage and current THD below 2.0% when supplied from sinusoidal source, Terminal block & Connectors: Heavy-duty, high-conductivity continuous rating IP20 terminal blocks of at least 63 A to reliably handle 70 A peak transients without heating. **4. Thermal, Enclosure, & Physical Auxiliary Systems** • Cooling Mechanism: Natural Air-Cooled (AN), Enclosure Panel: Floor-standing, heavy-gauge sheet steel ventilated industrial enclosure panel rated for standard indoor IP20 service, Mobility System: The base structural frame integrated with heavy-duty swivel castor wheels with foot brakes. **5. Mandatory Post-Test Data Submission** No-Load Core Losses & Full-Load Copper Losses: Explicitly measured and tabulated in Watts (W) at fundamental 50 Hz conditions. Temperature Rise Profile: Validated heat-run test data proving compliance with Class F limits under continuous full-rated load.
7	**Three phase 415V, 20Amp, 50Hz Inductors (Special Design)**	1	Three phase 415V, 20Amp, 50Hz Inductors (Special Design) **Technical Specifications:** **1. Nominal Electrical Parameters Specifications :** Custom-engineered, Dry-Type, Moving-Core (Rotating/Plunger Type) Variable Three-Phase Linear Inductor / Power Reactor housed in a standard indoor. Voltage & Supply: Rated for 415 V AC Line-to-Line (L-L), 3-Phase, 50 Hz utility or experimental source networks. Inductance Tuning Mechanism: Mechanical Rotating Type utilizing a heavy-duty external hand wheel or rotating wheel assembly equipped with a positive physical locking lever to firmly secure the air gap position. Inductance Tuning Range: Continuously variable inductance spanning from a minimum value of 30 mH up to 300 mH.

			Impedance-Limited Current Profile: Optimised for a voltage-limited operational envelope under a fixed 415 V excitation. Current ratings are scaled to the impedance curve as follows: 30 mH to 38 mH Range: Handles a full 20 A continuous AC RMS current. 38 mH to 300 mH Range: Current linearly scales down due to impedance to approximately 2.5 A AC RMS at the maximum 300 mH configuration. Calibration & Symmetry: Delivered with an operational calibration table mapping exact current capacity against inductance across the mechanical adjustment track. Phase mismatch must remain under 5.0% between any two phases to preserve system symmetry. **2. Magnetic Core Material & Linearity Specifications:** Core Construction: High-permeability, low-loss Cold Rolled Grain Oriented (CRGO) Silicon Steel utilizing standard laminations of 0.27 mm to 0.30 mm thickness with surface insulation coating. Energy Storage Capability: Designed to support a peak magnetic energy capability greater than 6 Joules per phase at the minimum inductance maximum current configuration. Linearity Profile: High-linearity performance featuring a linear B-H curve up to 1.5 times the rated current tracking envelope across all mechanical tuning configurations. Mechanical Integrity: Moving core guide tracks must be precision-machined to eliminate structural magnetic chatter, air-gap drift, humming, or mechanical binding during positioning. **3. Windings, Terminals, & Electrical Performance:** Conductor Material: High-conductivity, electrolytic-grade 99.9% pure Copper winding elements configured with a Class F minimum insulation system. Independent Coil Access: Stator and rotor coil links for each phase must be brought out to independent, isolated connection nodes inside the terminal block area. Windings must safely handle a secondary DC current excitation of at least 15 A at the 100 mH tuning mark for hybrid loading research. Waveform Integrity: Total Harmonic Distortion (THD) of the induced voltage and current waveforms must remain below 2.0% when supplied from a clean sinusoidal source. Terminal Specifications: High-current carrying capacity, heavy-duty continuous rating IP20 terminal blocks rated for at least 40 A to support transient loads without heating. **4. Thermal, Enclosure, & Physical Auxiliary Systems:** Cooling Mechanism: Natural Air-Cooled (AN) passive convection framework. Enclosure Panel: Floor-standing, heavy-gauge sheet steel ventilated industrial enclosure panel rated for standard indoor IP20 service. Mobility & Markings: Base structural frame must be integrated with heavy-duty swivel castor wheels equipped with independent foot brakes to facilitate easy lab repositioning. The external terminal array must feature highly visible, permanent RYB (Red-Yellow-Blue) color-coded nodes. **5. Mandatory Post-Test Data Submission:** Loss Reports: Certified factory test reports measuring and tabulating No-Load Core Losses and Full-Load Copper Losses in Watts (W) at fundamental 50 Hz conditions prior to dispatch. Thermal Validation: Validated heat-run test profile data proving strict compliance with Class F temperature rise limits under continuous, full-rated load profiles.
8	**IGBT based 3-phase 4 leg Voltage Source Converter**	1	**System Topology:** 3-Phase, 415 V, 25 kVA Converter System featuring a Three-Phase Diode Input Rectifier integrated with a Three-Phase, Four-Leg (Neutral leg included) IGBT-based Voltage Source Converter/Inverter (VSC) housed in a standard indoor IP20 layout configuration. **Technical Specifications:**

	with 3-phase diode bridge rectifier (3 Phase, 415 V, 25kVA)		**1. System Performance Ratings:** • Input AC Voltage: 3-Phase, 415 V, 50 Hz fundamental frequency. • Continuous Output Capacity: 25 kVA nominal, 35 A output AC current. • DC Bus Operating Range: Baseline DC link pre-charged to 560 V DC, with an active VSC boost capacity up to 750 V DC maximum. • Switching Frequency: Optimized for 20 kHz carrier control. • Application Suitability: Designed for variable frequency drive (VFD) systems and active power filter applications. • Diagnostics: Must include multiple physical safe waveform observation test points accessible via Oscilloscope (CRO). **2. Internal Hardware Requirements (Per Unit Complete):** (a) Power Switching Modules: 4 × Dual-Switch IGBT Half-Bridge modules (Total 8 switches) rated for greater than 1200V and greater than 150A continuous conduction in an industry-standard low-inductance housing (62mm footprint or equivalent standard package). Must feature a low-inductance case design, voltage-controlled MOS input, and fast/soft inverse CAL diodes rated for a minimum of 150 A and more with a maximum junction temperature Tj of 175°C. (b) Gate Drive Units: 4 × Dual-channel plug-and-play gate drivers directly driving two switches per IGBT module, compatible with the supplied IGBT modules. Drivers must feature a standard 15 V logic input signal level, integrated interlocking dead-time protection (minimum 2 µs), error reset functionality, active short-circuit protection, and dynamic IGBT switching behavior control. (c) Input Rectifier Module: 1 × Discrete 3-phase diode bridge rectifier module rated for a minimum of 1600 V peak reverse blocking voltage and a minimum of 160 A nominal continuous DC load current. Must handle a continuous DC bus input current of at least 38 A. (d) DC Link Capacitors: Total bank capacitance configured using 2 × 4700 µF, 500 V capacitors connected in series (yielding a net 2350 µF / 1000 V capacity), complete with parallel static voltage-balancing resistors. (e) Surge & Thermal Protection: 4 × Snubber Capacitors rated for 0.47 µF / 1500 V DC connected directly across the DC link for voltage overshoot mitigation. Includes a thermal trip sensor calibrated to shut down the system at 90°C. (f) Thermal Management Enclosure: Enclosure cooling provided by a 400 mm aluminum heatsink coupled with an internal forced-air cooling fan (powered via single-phase 230 V AC supply) establishing a linear air velocity of 8–10 m/s at a 40°C design ambient rating. (g) Electrical Safety Shielding: All active internal power modules, capacitors, and busbars must be fully housed underneath a transparent polycarbonate protective shield equipped with external safety insulating knobs to prevent accidental shock.
9	**Three phase 440 V Excitation capacitor in kVAR-different rating**	1	Three phase 440 V Excitation capacitor in kVAR-different ratings **Technical Specification:** Three phase Excitation capacitor (kVAR): Power Capacitor bank, 3-phase, 440V, ac, 50Hz, with different kVAR rating: (i) 0.25kVAR (3 units), (ii) 0.5kVAR (3 units), (iii) 1.0kVAR (3 units), (iv) 2.0kVAR (3 units), (v) 5.0kVAR (3 units), (vi) 7.5kVAR (3 units). **Note:** Equivalency Clause: If exact kVAR configurations are unavailable in standard manufacturing catalogues, the vendor may supply the nearest standard industrial equivalent rating, subject to structural review. **1. Dielectric Material & Safety Architecture:** • Technology: Heavy-duty, gas-insulated or dry resin-filled Metallised Polypropylene (MPP) film layout featuring robust self-healing characteristics

			to survive high transient inrush currents during passive generator self-excitation. • Protection Integration: Every individual 3-phase unit must incorporate an integrated internal overpressure disconnect or mechanism to isolate the capacitor safely at the end of its operational life. • Discharge Safety: Built-in premium discharge resistors required across all terminals to automatically bleed residual voltages down to a touch-safe level below 50 V within 60 seconds of network isolation. **2. Windings, Enclosure, & Interfacing:** • Terminals & Switching: Heavy-duty, finger-safe IP20 terminal connectors rated for up to 32 A continuous current. The front panel must feature heavy-duty rotary selection switches or industrial contactors to allow independent switching of each individual capacitor block. • Physical Layout: Floor-standing or benchtop-ready rigid sheet-steel enclosure finished with anti-corrosive powder coating under an IP20 ventilation class footprint. • Mobility & Wiring: Fitted with swivel castor wheels featuring independent foot locks. The interface panel must display permanent, highly visible RYB (Red-Yellow-Blue) color-coded connectors for every capacitor tier.

The Bidders may download the **Tender Documents** directly from the website available at **http://www.vssut.ac.in** and the Earnest Money Deposit (EMD) (Rs.50,000/-) amount and the Tender cost fee of Rs. 1000/- (Non-refundable) by way of separate Demand Draft drawn in favour of **"The Registrar, Veer Surendra Sai University of Technology, Burla" payable at SBI, Burla** should be enclosed along with the Technical Bid. In case of any bid clarification, responsibility lies with the bidders to collect the same from the website and the purchaser shall have no responsibility for any delay/ omission on part of the bidder.

TIME SCHEDULE:

a) Date of commencement of downloading bidding document –**15/ 10 /2026 at 04.30 PM**

b) Last date and time for Receipt of bids - **06/11 /2026 up to 4.30 PM**

c) Time and date of opening of Tender & Technical bid- **07 /11 /2026 at 11.30AM**

d) Time and date of opening of Financial bid- **12/11 /2026 at 04.30PM**

PLACE OF OPENING OF TENDER AND ADDRESS FOR COMMUNICATION AND RECEIPT OF BID DOCUMENTS

THE REGISTRAR

VEER SURENDRA SAI UNIVERSITY OF TECHNLOGY, ODISHA

At- Burla, Po-Burla Engineering College, Dist-Sambalpur-768018,

Tel. No-0663-2430211 Fax No-0663–2430204

REGISTRAR
VSSUT, Burla

VSSUT, Burla

SECTION-1

TECHNICAL PROPOSAL SUBMISSION FORM

LETTER OF BID

To
The Registrar
VSSUT, Burla- 768018

Ref: Invitation for **Tender Notice No.**_____ **, Date:**_____

We, the undersigned, declare that:

1. We have examined and have no reservations to the Bidding Documents, including addenda issued in accordance with Instructions to Bidders.
2. We offer to execute in conformity with the Bidding Documents for **Supply, Installation, Commissioning, Maintenance and Demonstration of Advanced Renewable Energy Systems Laboratory (ARESL) : Machines, Magnetics & Converter equipment for the department of Electrical Engineering VSSUT, BURLA**
3. Our bid shall be valid for a period of **180 days** from the date fixed for the bid submission deadline in accordance with the Bidding Documents and it shall remain binding upon us and maybe accepted at any time before expiry of that period.
4. If our bid is accepted, we commit to submit a performance security in accordance with the Bidding Documents.
5. We also declare that Government of Odisha or any other Government body has not declared us ineligible or black listed on charges of engaging in corrupt, fraudulent, collusive or coercive practices or any failure/lapses of serious nature.
6. We also accept all the terms and conditions of this bidding document and undertake to abide by them, including the condition that you are not bound to accept highest ranked bid / lowest bid or any other bid that you may receive.

Yours sincerely,

Authorized Signatory with company seal (Authorized person shall attach a copy of Authorization for signing on behalf of Bidding Company)

Full Name and Designation

(To be printed on Bidder's letterhead)

VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY: BURLA

P.O: Engineering College Burla (Siddhi Vihar), Dist : Sambalpur
Odisha– 768018, India
Website :www.vssut.ac.in, E-mail: registrar@vssut.ac.in,Ph:(0663)2430573,Fax-2430592

INSTRUCTIONS TO THE BIDDER

General Terms and Conditions

GENERAL TERMS & CONDITIONS OF CONTRACT FOR SUPPLY, INSTALLATION, COMMISSIONING, MAINTENANCE AND DEMONSTRATION OF ADVANCED RENEWABLE ENERGY SYSTEMS: MACHINES, MAGNETICS AND CONVERTERLAB EQUIPMENTSAS REQUIRED FOR THE DEPARTMENT OF ELECTRICAL ENGINEERING, VSSUT, BURLA, ODISHA.

1. GENERAL INSTRUCTIONS

The department of Electrical Engineering, VSSUT, Burla, requires **Advanced Renewable Energy Systems Laboratory (ARESL) : Machines, Magnetics & Converter equipment** of mentioned specifications to be supplied, installed, commissioned, maintained and demonstrated at the site. The list of equipment is given in Table No. 2 below.

Table. No. 2: List of Equipment Required

Sl. No	Item &Description	Quantity
1	3.7kW, 240V BLDC generator coupled with 7.5hp, 415V induction motor.	1
2	3.7kW, 240V three phase Induction Generator coupled with 5hp, 415V induction motor	1
3	3.7kW, 240V three phase Permanent Magnet Synchronous Generator coupled with 7.5hp, 415V Induction Motor	1
4	3.7kW, 240V three phase Micro Generator with Automatic Control system	1
5	Three phase, 10kVA Multi tapping transformer	1
6	Multi-tapping inductors	1
7	Three phase 415V, 20Amp, 50Hz Inductors (Special Design)	1

8	8 Nos IGBT based Voltage Source Converter (3 Phase, 415 V, 25kVA)	1
9	Three phase 440 V Excitation capacitor in kVAR-different rating	1

The detailed specification requirement of the equipment is mentioned in the the tender documents may be downloaded from our university website http://www.vssut.ac.in.

While all efforts have been made to avoid errors in the drafting of the tender documents, the Bidder is advised to check the same carefully get it clarified before submission of tender and no claim on account of any errors detected later in the tender documents shall be entertained.

Each page of the Tender documents must be stamped, signed and numbered by the bidder submitting the tender in token of his/her having acquainted himself / herself and accepted the entire tender documents including various conditions of contract. **Any Bid with any of the documents not so signed is liable to be rejected at the discretion of the University.**

NO PAGE SHOULD BE REMOVED/ DETACHED FROM THIS BIDDING DOCUMENT.

The bidder shall attach copy of the authorization letter / power of Attorney as the proof of authorization for signing on behalf of the Bidder.

All Bidders are hereby explicitly informed that conditional offer or offers with deviations from the conditions of Contract, the bids not meeting the minimum eligibility criteria, Technical Bids not accompanied with EMD, Non-Responsive Technical Bids or any other requirements, stipulated in the tender documents are **liable to be rejected**.

The parties to the Bid shall be the "Bidders'' (to whom the work can be awarded) and VSSUT, Burla shall be termed as the University who can accept/reject any bid without assigning areas on.

For all purposes of the contract including arbitration there under, the address of the bidder mentioned in the bid shall be final unless the bidder notifies a change of address by a separate letter sent by registered post with acknowledgement to VSSUT, Burla. The bidder shall be solely responsible for the consequences of any omission or error to notify change of address in the aforesaid manner.

The University reserves the right to amend/cancel this tender at any stage/time without assigning any reason. The decision/ interpretation of the competent authority of University shall be final and binding.

1. Document Establishing Bidder's Eligibility & Qualification

The Bidders shall furnish as part of the Bid the following Documents establishing Bidder's eligibility and qualification to the Purchaser's satisfaction.

1.1 Manufacturer / Authorized Distributor / Dealer having valid license / certificates for the quoted item and the direct Importers holding valid Import License Manufacturer / Authorized Distributor / Dealer of the product are eligible to participate in the Bid.

1.2 Bidders should have **ISI or equivalent** certification for quoted instruments and equipment. However, the Purchaser shall have the right to consider the items where ISI or equivalent certification is not applicable.

1.3 The Bidder whether manufacturer/ distributor/ dealer must have experience of supply and installation of similar items as quoted in Bid, at different Govt. Organizations, PSUs / Reputed Government Institution & Universities like IITs, NITs/ Reputed Private Institutions within India during at least last preceding 2(Two) years reckoned from the date of bid opening and the details must be submitted along with documentary proof.(**Annexure-VI**). More than 2 years' of experience, shall be preferred.

1.4 The Bidders shall have to produce document in support of their service associates **nearest to an Eastern State of India/ Bhubaneswar/ Sambalpur/in Western Region of Odisha.**

1.5 Bidder shall have to provide demonstration of different hardware component **to Purchaser.**

1.6 The Bidder shall quote items of one reputed Brand/model with all accessories, wherever applicable, with desired specification in complete to perform functionality of Equipment.

1.7 Manufacturer must submit copy Company Incorporation Certificate (CIN) and (GST) Tax Registration Certificate issued from Competent authority. In case of Authorized Distributor / Dealer/Suppliers must submit Manufacture authorization along with copy of above documents of Manufacture Industry.

1.8 The bidder must have GST registration in the state of Odisha. If not registered, an **affidavit must be submitted**, committing to obtain the Odisha GST certificate before finalization of the bid otherwise ten derer have all rights to disqualify the bid of the bidder.

1.9 The bidder may furnish a valid and current registration certificate issued by the National Small Industries Corporation (NSIC). However, submission of this certificate is mandatory

for bidders seeking to avail any exemptions or preferences applicable to MSMEs as per the prevailing Public Procurement Policy.

2. Document Establishing Goods' Eligibility

The various equipment, hardware and software offered against the schedule of requirement, should be in accordance with the stipulated specifications and of one reputed brand/model, wherever applicable(N.B: Variation in specification is allowed upto±5% in case of different hardware)

2.1 The bidder shall submit Product Data Sheets / Catalogues of the quoted products and provide details of the specifications of equipment, hardware and software with major technical features as enlisted in in the **complete sets of Annexure-V.**

2.2The bidder shall clearly specify in the bid the compatibility of the various equipment and individual units.

2.3 The quantity shown in the bid can be increased or decreased to any extent depending upon the actual requirement.

2.4Differentequipment/machine/hardware/software should have testing certificate for its satisfactory functioning.

3. Technical Bid (COVER - A)

The following document should be submitted in **Cover-A, the first page being the Technical Proposal Submission Form (Letter of Bid) mentioned in Section 1,** duly signed in Bidder's letterhead. Any documents not mentioned in this section but mentioned in section 1 & section 2, must also be included in **Cover-A.**

3.1 Tender Cost Fee and the Earnest Money Depositin the form of separate DD, as specified in Tender Call Notice in website of University

3.2 Technical details and specifications of different Equipment/software/hardware in the complete sets of **Annexure-V.**

3.3Copy of the manufacturing license/ import license/ Authorized Distributor/ Dealer certificates

3.4 Copy of the authorization from the Manufacturing Company in case of Authorized Distributor /Dealer(**Annexure-III**) along with Manufacturer Industry Registration and Tax Registration Certificate.

3.5 GST clearance certificate up to date where applicable.

3.6 Certificates declaring Performance credential / Market standing / Installation certificate/ Competency Certificate establishing that the Bidders have executed supply of similar items as mentioned in Schedule of Requirement of equipment, hardware and software to different Govt. Organizations, PSUs/ Reputed Government Institution & Universities like IITs, NITs/ Reputed Private Institutions.(**Annexure-VI**)

3.7 Copy of the IT PAN Card should be submitted.

3.8 Detail name, address, telephone no. fax, e-mail of the firm(bidder) and of the Director/ Managing Director/ Proprietor of the firm(bidder) (As per **Annexure IV**)

3.9 Address, Telephone No., e-mail, Fax of the Branch Office/ Contact Person/ Liaising Office in Odisha. (As per **Annexure IV**)

3.10 Power of Attorney/ Authorization to a person for liaising and monitoring the business on behalf of the manufacturer / bidder/ Joint Venture Consortium but not entitled to raise the bills.

3.11Bidder/OEM must submit mandatory certification i.e. ISO 9001:2015 and some additional certification documents like ISO 14001:2015, ISO 45001:2018, CE, RoHS, GMP, OEM should also be submitted to claim better quality of the equipment.

3.12The original bid document signed & sealed by authorized person in each page as a token of acceptance of all terms and conditions of the tender with original receipt.

3.13 Documentary evidence establishing that the equipment, hardware, software and ancillary services to be supplied by the Bidders shall confirm to the Bidding Document

3.14 Any deviation in the specification of the item including standard accessories / optional accessories in complete for functionality of hardware should be marked in **bold letters.**

3.15 Technical and other details of different hardware, software, equipment if any, should be provided.

3.16 The details of the service station / service associates nearest to Bhubaneswar/Sambalpur/ in Eastern Region of India, shall have to be submitted to qualify in the technical bid.

3.17 All bidders are required to e-mail well in advance to confirm site visit availability. Upon receiving approval, bidders shall visit the site at their own expense and submit a compliance report along with a photograph of the site approval as proof, as well as a layout plan prepared according to the site conditions, to be included with the bid in the Technical Specification Bid.

3.18 Bidder should be affiliated with the relevant Sector Skill Council (SSC) in India related to the specific skill development program or training initiative. Bidders who produce true copy of Bid specific authorization from Sector Skill Council or authorization letter from ASDC, shall be preferred during technical bid evaluation.

3.19 Bidders shall quote only those products (Part of Service delivery) in the bid and must provide necessary declaration by OEM showing the quoted equipment (Hardware/software etc), which are not obsolete in market and has at least 5 years of residual market life, i.e. the offered product shall not be declared end of life by the OEM before this period.

4. **Financial Bid (COVER – B)**

4.1 The hard copy of Financial Bid giving the rates for various instruments & equipment and other items should be submitted along with sealed soft copy of **Financial bid in Excel format through CD/Pen drive** both in separate sealed cover hereinafter called **Cover B (Financial Bid).**

4.2 The price of each item shall be quoted as per the prescribed Price Schedule Format at **Annexure-I** along with price break up of custom duty, Excise Duty, GST, Packing, Forwarding and Handling charges, Insurance charges, ET, Freight up to destination including unloading, commissioning including testing and training with total price per item at thedestination. The bidders are required to submit the individual price of each item as indicated in the schedule of requirements.

4.3 Each quoted item and all accessories should cover the warranty for **2(two)** years from the date of commissioning **(Annexure-II)**.

4.4 The **Cover B** of the **Technically qualified** bidders shall be only opened at the Office of **"The Registrar, Veer Surendra Sai University of Technology, Burla"** on the date and time as specified in the tender document, after evaluation of technical bid in **Cover A** as per eligibility conditions laid down in section 1,2 and 3 of this document and minimum technical score, by a Technical Committee appointed by the Purchaser (See section 5.16 for details)

4.5 The cost of standard accessories shall be included in basic price and optional accessories shall have to be quoted separately.

5 BID CONDITIONS

5.1 The quoted rate shall not vary with the quantum of order placed or destination point.

5.2 A copy of the original bid conditions and the schedules should be signed by the bidder at the bottom of each page with the office seal duly affixed and returned along with the bid. Bid schedule should be duly filled in with an **index** and **page number** for the documents, enclosures & EMD etc. **Page Numbering** must be done for all the documents submitted.

5.4 Bids should be type written or Computerized and every correction/ over writing in the bid should invariably be attested with signature of the bidder with date before submission of the bids to the authorities concerned. No revision of price upward or downward will be allowed once the bid is opened. However, the purchaser shall have the right for considering the exchange rate of foreign currencies on verification of documents.

5.5 Language of Bid

The Bid prepared by the bidders and all correspondence and document relating to the bid exchanged by the Bidders and the *Purchaser*, shall be written in the English language. Supporting document and printed literature furnished by the Bidders may be written in another language provided they are accompanied by an accurate translation of the relevant passages in the English language in which case, for purposes of interpretation of the Bid, the English translation shall govern.

5.6 Bid Price

- The contract shall be for the full quantity as described above. Corrections, if any, shall be made by crossing out, initialling, dating and re-writing.
- All duties, taxes, and other levies payable on the raw materials and components, job contract, software and hardware equipment, shall be included in the total price.
- GST in connection with the sale shall be shown separately.
- The rates quoted by the bidders shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
- The price shall be quoted in Indian Rupees only.

5.7 **GST clearance**

Copies of valid GST clearance Certificates shall be furnished by the Bidders, and the originals of the above certificates shall be produced to the purchaser before placement of notification of award if asked for by the Purchaser.

5.8 **EMD**

All bidders are required to submit **EMD of Rs. 50,000/-**in shape of **Demand draft** drawn in favour of **"The Registrar, Veer Surendra Sai University of Technology, Burla" payable at SBI, Burla**only. The EMD shall be in Indian Rupees.

NOTE: Non-submission of EMD or submission of less EMD than the desired one shall result in rejection of Bid. The EMD deposited against other Bids cannot be adjusted or considered for this Bid. No interest is payable on EMD. In the absence of the EMD, technical proposal of the bidder shall be rejected. However, as per the Finance Department, Govt. of Odisha office memorandum no. 21926 dated 12.8.2015, the local MSMEs registered with respective DICs, Khadi, Village, Cottage & Handicraft Industries, OSIC and NSIC are exempted from submission of EMD while participating in tenders of Govt. Departments and Agencies under its control. It is further clarified that the above exemption is applicable to local MSMEs registered in Odisha only. This exemption to the local MSMEs shall be applicable if the kind of service as required under this tender enquiry is clearly specified against the details of the service to be provided in their DIC / NSIC registration certificate (to be furnished in the technical bid).

5.9 **SUBMISSION OF BIDS**

Sealing and Marking of Bids

Bid should be submitted in two Bid system containing two parts as detailed below.

Sealed Cover-A: Technical Bid.(Apart from documents mentioned in section 3, any document mentioned in section 1 & 2 should also be within this cover)

Sealed Cover-B: Financial Bid (hardcopy & sealed soft copy in CD/pen drive)

Both the sealed envelopes of Cover- A and B should then be put in one Outer Coverand each cover should have the following indication:

i) Name of Dept.:_____

ii) Reference No of Bid _____

iii) Bid regarding _____

iv) Due date & time for submission of the Bid _____

v) Due date & time for opening of the Bid _____

vi) Name of the Firm _____

NOTE:

A. Bids submitted without following two Bid system procedures as mentioned above will be summarily rejected.

B. Please Note that **prices should not be indicated in the Technical Bid**. The Prequalification document including EMD as required in the Bid document should invariable be accompanied with the Technical Bid (**Cover A**).

The outer envelope shall indicate the name and address of the bidders to enable the bid to be returned unopened in case it is declared "**late**". If the cover containing the outer envelope is not sealed and marked as required, ***Purchaser*** will assume no responsibility for the bid's misplacement or premature opening.

The above procedure shall be adopted both for the **Technical bid and Financial bid separately**. Telex, cable, email or facsimile bids will be rejected. Note here that, the documents in proof of suppliers and goods eligibility mentioned in section 1, 2 along with Technical Bid documents mentioned in section 3 should be placed in the same order as mentioned in the bid document with proper indexing and page numbering and preferably spiral bound.

5.10 **Deadline for Submission of Bids**

Bids must be received by the ***Purchaser*** at the address specified not later than the time and date specified in the Invitation of Bids. In the event of the specified date for the submission of bids being declared a holiday for the ***Purchaser***, the bids will be received up to the appointed time on the next working day.

The ***Purchaser*** may, at its discretion, extend this deadline for submission of bids by amending the bid document, in which case all previous rights and obligations of the purchasers and bidders will remain same till the extended date.

5.11 **Modification and Withdrawal of Bids**

No Modification and Withdrawal of Bids is allowed between the interval of time of submission and the last date and time of the bids.

No bid may be withdrawn in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the bidders on the bid form.

5.12 **BID OPENING**

5.12.1All the Technical Bids will be opened by the Technical Evaluation Committee authorised by the purchaser, on the specified date and time, at the Office of the **"The Registrar, Veer Surendra Sai University of Technology, Burla",** in the presence of bidder's representatives who choose to attend the bid opening. The bidders must have submitted authorization letters for the concerned representative.

5.12.2 The bidder's representatives who are present shall sign a register evidencing their attendance. In the event of the specified date of bid opening being declared a holiday for the ***Purchaser***, the bids shall be opened at the appointed time and location on the next working day.

5.12.3 The bidder's names, and the presence or absence of the requisite EMD and such other details as the ***Purchaser***, at its discretion, may consider appropriate, will be announced at the opening of Bids. No bid shall be rejected during bid opening, except for late bids, which shall be returned unopened to the bidders.

5.12.4All the bidders, whose technical bids are eligible after evaluation of documents by technical committee, are required to **further give a presentation (Modalities and other**

details of which shall be communicated via mail) arranged and scheduled by purchaser on a suitable date and time after opening of technical bid.

5.13**Acceptance of the Bid**

5.13.1 Bidders submitting bids would be considered as the ones who have verified and accepted all terms and conditions. No enquiries, verbal or written, shall be entertained in respect of acceptance or rejection of the bid.

5.13.2.Genuine equipment, software/hardware etc. should be supplied. Bidders should indicate the source of supply i.e. name and address of the manufacturers from whom the items are to be sourced.

5.13.3.Supply of equipment means – Installation and Commissioning (except civil works), Demonstration as well as Training and maintenance at site. **No separate charges will be paid on this account.**

5.14**Rejection of the Bid**

The Bid document may be out-rightly rejected under following stipulation and no correspondence will be entertained whatsoever.

5.14.1 If the Bidder has failed to furnish the required **Tender paper cost** and **EMD amount mentioned/**or Failure to provide valid, verifiable regulatory certificates to claim a legal exemption, if applicable.

5.14.2.**Deviation from Core Technical Specifications:** Any "No" or negative deviation listed in the mandatory technical compliance sheet for the customized hardware/machinery. In such case, bidder shall be declared Non-responsive, and the bid rejected.

5.14.3 If the Bidder has not submitted the Financial Bid as per the prescribed format **Annexure-I**

5.14.4 **If the Bidder has not submitted warranty certificate** as per the prescribed format **Annexure-II**

5.14.5 Manufacturing Authorization as per **Annexure-III** and in case of Authorized Distributor / Dealer/Suppliers, has not submitted Manufacture authorization from Manufacturing Industry/Firm, Photo copy of the up-to-date valid manufacturing license/ import license (if it is imported) /dealership certificate/Distributor certificate of the product along with Tax registration Certificate of Manufacturer issued from competent authority. Missing

mandatory statutory documents such as a valid GSTIN registration, PAN card, or audited financial balance sheets.

5.14.6 If the bidders, whether manufacturer or authorized distributor/ dealer have not supplied the required information as per **Annexure-IV with supporting documents.**

5.14.7If the bidder has not furnished technical details of the different hardware with **one make & model** as per **Annexure-V.**

5.14.8If the Bidder is found to be blacklisted by any Central/State Government Department or PSU.

5.14.9 If the bidder is found to be Non-responsive due to not meeting the Non-Divisible Package Bid nature of Tender. (See Section 5.17.2)

5.14.10 If the bidders have not agreed to give **bid validity**.

5.15Purchaser's Right to Accept any Bid and to Reject any Bid

The Purchaser reserves the right to accept or reject any bid and to annul the bidding process and reject all the bids without assigning any reason thereof at any time prior to award of Contract, without thereby incurring any liability to the affected Bidders or Bidders on the grounds of such action of the purchaser. In case no bidder qualifies as per qualifying criteria and standards, purchaser may at his discretion relax qualification criteria for award of contract.

5.16Comparison and Evaluation of Bids

The University shall follow quality and cost-based selection bid evaluation system (QCBS) where both the technical bid and financial bid shall be considered for evaluation after qualifying in the technical bid as per prescribed criteria. Some general criteria that will be adopted for both technical and financial bids as applicable are explained below.

5.16.1 The comparison shall be of FOR destination price basis including the price of all costs wherever applicable as well as duties and taxes (**but excluding GST**) paid or payable on Machineries, instruments & equipment incorporated or to be incorporated in the items including the warrantee/guarantee period from the date of installation.

5.16.2 The Purchaser's evaluation of a bid will consider, in addition to the bid price and the price of incidental services.

5.16.3 The purpose of bid evaluation is to determine substantially responsive bid with the **highest**

evaluated score of (Technical Bid Score(Ts)+ Financial Bid Score(Fs)), but not necessarily the lowest submitted L1 price, which should be recommended for award. (See section 5.17)

5.16.4 Evaluation of bids should be made strictly in terms of the provisions in the bid document to ensure compliance with the technical and financial aspects.

5.16.5 The past performance of the suppliers will be considered while evaluating the bids.

5.16.6 Cost of the inland transportation, insurance and other costs within the Purchaser's Country incidental to delivery of the goods to their destination.

5.16.7 Delivery schedule offered in the bid.

5.16.8 Deviations in payment schedule from that specified in the General Terms & Conditions of Contract.

5.16.9 The projected operating and maintenance costs during the life of the equipment/ goods.

5.16.10 The performance and productivity of the equipment/goods offered.

5.16.11 The quality and adaptability as per specifications supported by valid Test reports/waveforms/Test Certificates/Test Accreditation from competent authority/ Customer Factory acceptance certificate etc pertaining to the equipment/ goods offered.

5.16.12 Bidders registered with the National Small Industries Corporation (NSIC) under the Single Point Registration Scheme (SPRS) for the items/services tendered may be eligible for benefits such as exemption from Earnest Money Deposit (EMD) as per Government of India norms. Such bidders must submit a valid NSIC certificate covering the tendered items.

5.16.13. Any other point as deemed proper to be incorporated by the evaluation committee.

5.16.14 Alternative options of offer shall not be allowed.

5.16.15 Each Bidder shall submit only one quotation with one make & model, wherever applicable.

5.16.16 GST in connection with sale of goods shall not be considered in evaluation.

5.17Bid Evaluation Procedure and Award of Bid

The Bid shall be awarded by following QCBS Methodology as explained earlier.

5.17.1 **Technical bid evaluation and scoring procedure**

For technical bid evaluation, marks will be awarded based on the criteria and pattern of marking as listed in Table no 1 or Table No.2, **as illustrated in Table No.3.**

Table No.3: Pattern of Score/ Mark(Ts) for Technical Bid Evaluation

S/N	Description	Scoring Pattern
1.	**Experience & Scale of Operations** • Years in business (beyond 2-yr minimum) **Max Score: 10 Marks**	**5 marks** for each year in operation for every year beyond minimum requirement of 2 years of operation in similar work
	Employee strength No. of Employee / Service Engineer/ Skilled/Semiskilled/unskilled strength **Max Score: 5Marks**	More than 10 Employee: **5 Marks** 05-10 Employees: **3 Marks** Less than 01-05 Employees: **1 Mark**
2	**In-house Infrastructure & Expertise** • Capabilities for manufacturing, installation, Maintenance & warranty support **Max Score:15 Marks**	OEM with fully in-house production and service/maintenance network: **15 Marks** Authorized system assembler with full service facilities: **12 Marks** Authorized distributor/dealer with local service tie-up: **10 Marks**
3.	**Past Performance** • Supply & commissioning of similar products in last 5 years (As per Annexure –VI) (Last 5 years) **Max Score: 25 Marks**	**4 Marks** for each successful work order **(Max 20 Marks)** • Bonus: **1** additional mark for each order executed at a reputed government institution (e.g., IITs, NITs, Central Labs) **(Max 5 Marks)**
4.	**Technical Presentation* & Customization Design** Review of design layout, engineering specs, and customization roadmap, warranty, delivery, installation, by technical committee **Max Score: 20 Marks**	Highly Satisfactory (80%–100% compliance): **20 Marks** • Satisfactory (60%–79% compliance): **12 Marks** • Marginally satisfactory / Non-appearance (50% to 59%% compliance): **4 Marks** • Unsatisfactory / Non-appearance (below 50%): **0 Mark**
5.	Financial Capability (Annual Turnover) • Average annual turnover of the last 3 financial years	Average turnover Above ₹50 Lakhs: **15 Marks** • Average turnover ₹10 Lakhs to ₹50 Lakhs: 7

	Max Score: 15 Marks	**Marks** • Average turnover Below ₹10 Lakhs: **0 Marks**
6.	Quality & Sector Certifications • Valid industry/regulatory certifications **Max Score: 10 Marks**	National Sector Skill Council (SSC) Certification: 2.5 Marks • ISO 9001 / CE / NSIC or other specified certification: 2.5 Marks each (Max 7.5 Marks)
	Total Technical Score:100 Marks	

Bids will first be evaluated against the Technical Scoring Pattern defined in Table No.3.

The bidders securing 55% of the total marks 100, (i.e., 55 Marks) assigned to technical bid, as per criteria of metrics mentioned in Table No. 3 shall be declared "Qualified in the Technical evaluation" or "Technically Responsive". Bidders with marks less than 55 shall be termed as "Technically Non-Responsive". Marks assigned to bidders by the appropriate committee and approved by competent authority, VSSUT, Burla shall not be questioned by any bidder. The bidders who qualify in the technical evaluation may be present at the time of opening of financial bids. However, the financial bids of all non-responsive bidders who fail to qualify in technical evaluation with Marks less than 55, shall not be considered any further, and therefore their bid stands disqualified and cancelled.

The Technical Bid Score (Ts) shall be evaluated from the actual technical marks obtained by all Technically responsive bidders by giving 30% weight age to the marks out of 100, as explained below.

Technical Bid Score (Ts) of a Bidder A = 0.30×(Technical Marks of Bidder A out of 100 Marks, as per Table No. 3)

5.17.2: Mandatory Technical Bid Qualification for all equipment

This tender is floated as a Non-Divisible Package Bid for an integrated system requiring the supply, installation, and commissioning of Nine (9) distinct equipment items, as specified in the schedule of requirements, mentioned in Table No.1 and Table.No.2

5.17.2.1 **Absolute Requirement for Multi-Equipment Qualification**

This tender requires the supply, installation, and commissioning of Nine (9) distinct types of equipment, as detailed in the Technical Specifications (See Table No.1&2). To be considered technically qualified for financial bid opening, a Bidder must successfully meet the minimum

technical qualification criteria and score at least the individual passing mark of 55% for each and every one of the Nine (9) equipment items listed.

5.17.2.2 **Consequences of Non-Qualification in Any Single Item**

Qualification is non-divisible and absolute across all item lines. If a Bidder fails to achieve the minimum 55% technical qualification mark in any single equipment category, the entire bid shall be deemed technically non-responsive and shall be summarily rejected and cancelled in its entirety.

5.17.2.3 **Illustrative Scenario for Disqualification**

For the avoidance of doubt, even if a Bidder satisfies or exceeds the 55% technical qualification mark in Eight (8) or less than (9) out of the Nine (9)equipment items, the failure to qualify in the remaining equipment item will result in the immediate rejection and cancellation of the entire package bid. No partial evaluations, partial awards, or split orders will be entertained under this tender.

5.17.3Financial Bid opening, Scoring procedure and Award of bid

The Financial Bids of all Technically Qualified or Responsive Bidders in the technical bid shall be opened on the appointed date and time in presence of the qualified bidders/their authorized representatives, who choose to be present at the time of opening of the financial bids. Absence of bidders or their authorized representatives shall not impair the legality of the process.

The financial bid shall have 70% weight age out of total combined (Technical+Financial) score of 100, which shall be judged based on equipment price and other charges as per **Annexure-I** offered by the bidders. The qualified bidder with lowest price quotes shall get highest Financial Bid Score of 70 and others getting inverse-proportionately lesser Score, as explained by following method

Financial Bid Score(Fs) of a Bidder A =
70× (Price quoted by L1 Bidder) / (Price Quoted by Bidder A)

5.17.4Important Note: CVC-compliant Abnormally Low Bid (ALB): If the financial quote of a bidder appears unrealistically low to the extent that it raises material concerns regarding the bidder's capability to deliver the customized item to the specified quality standards, the Technical Committee reserves the right to seek detailed price justifications and cost breakdowns

from the bidder. Failure to provide a satisfactory justification demonstrating commercial viability shall result in the bid being rejected as non-responsive.

5.17.5Combined Score and Award of BID

The Bid shall be awarded to the Responsive Bidder that will score highest Combined Score Cs = Technical Bid Score (Ts) + Financial Bid Score (Fs), as obtained from above.

Note: In case more than one bidder gets the same highest score, then the bidder with the highest Technical Bid Score (Ts) shall be awarded the contract.

6. **Pre-dispatch Inspection, Delivery, Installation& Commissioning and Warranty Conditions**

6.1 **Delivery of Goods/ Equipment**

The delivery of goods shall be made by the supplier to the Consignee in accordance with the order placed as shall be detailed in the Schedule of requirements & technical specifications.

6.2 **Equipment Set up Demonstration and Training**

The supplier shall arrange suitable operation demonstration, give suitable operating manual and facilitate training to staff members at the purchaser's Laboratory premises, after installation and commissioning of equipment is completed. .

6.3 **Inspection/ Test/Training**

6.3.1: The supplier shall get each equipment inspected in manufacturer's works and submit a test certificate (New & Unused) and guarantee/warranty certificate that the equipment confirms to laid down specifications.

6.3.2 The supplier shall invite the purchaser for pre-dispatch inspection. The Purchaser or his representative shall have the right to inspect/ examine/ test the goods in conformity with the contract awarded/supply order during the production or before dispatch from the manufacturer's premises. Such inspection and clearance will not prejudice the right of the consignee to inspect and test the equipment on receipt at destination.The Technical Evaluation Committee (or its authorized representative) have the right to ask the successful bidder to arrange a comprehensive, live physical performance demonstration at their factory testing bay or an approved testing facility at their own cost.

6.3.3 The purchaser's right to inspect/ examine/test & where necessary to reject the instruments after the arrival of the goods at the destination, shall in no way be limited or waived by the reason of the goods having been inspected and tested by the manufacturer previously. In case of rejection of the goods at the final destination after inspection and test as stipulated above and in case any inspected/ tested goods fail to conform to the specification/ working condition, the purchaser may reject them, and the supplier shall replace/ repair the same free of cost.

6.4 **Warrantee Period (comprehensive)**

The Bidders must quote for a minimum period of **2 (Two) years** of comprehensive **warranty** from the date of completion of the satisfactory commissioning as per **(Annexure-II)**. This also includes all accessories related to instruments & equipment quoted for.

6.5 **Up time Warrantee**

The Bidders should provide uptime guarantee of 95%.

6.6 **Downtime Penalty Clause**

During the warranty period, desired uptime of 95% of 365 days (24 hours) if downtime exceeds 5%, penalty in the form of extended warranty, double the number of days or more will be applied for which the equipment goes out of service.

6.7 **Payment Terms**

No advance payment will be made by the Purchaser to the supplier for performance of the contract. 100% of the contract price shall be paid within 30 (thirty) days after satisfactory supply, installation, demonstration, Commissioning & training and stock entry of bills of the goods within due date of delivery.

6.8 **Transportation**

The Supplier shall be required to meet all transport and storage expenses until commissioning of the instrument(s) / equipment covered in the contract.

6.9 **Taxes and Duties**

The Supplier shall be entirely responsible for payment of all Taxes, Duties etc. incurred until delivery of the contract goods to the Consignee subject to recovery afterwards in the bill as claimed in the Bid offer. GST will be paid to the supplier

Entry Tax, if paid by the Supplier, at the local (destination head) Corporation/ Municipality/ NAC is allowed once only on production of money receipt for such payment, if claimed in the Bid offer. Any other statutory levy imposed by the Govt. of India/ Govt. of Odisha from time to time will be considered extra on demand with adequate proof thereof The service tax and the work contract tax shall be levied (Wherever applicable). Income Tax as applicable shall be deducted at source.

6.10 **Incidental Services**

The Supplier shall be required to provide any or all the following services: (The cost should be included in the quoted Price)

- Furnishing of detailed literature/pamphlets/ circuit diagram/ operation & maintenance manual / drawings (as applicable) for each appropriate unit of supplied goods.
- Furnishing of tools required for assembly and / or maintenance of the supplied goods.
- Performance or supervision of on-site assembly and the supplied goods.
- Performance or supervision or maintenance and/ or repair of the supplied goods, for a period agreed by the parties, provided that this service shall not relieve the supplier of any warranty/ guarantee obligations under the contract.

6.11 **Period of Validity of Bids**

- The bid rates should be kept open/ valid for a period of **180** days from the date the Bids are opened.
- A bid valid for a shorter period i.e. less than **180** days shall be rejected, as nonresponsive.
- In absence of any indication of the date of validity in the bid, it will be presumed that the offer will remain valid for the minimum period i.e. **180** days as prescribed above.
- In exceptional circumstances the purchaser may solicit the bidder's consent for extension of the period of validity. If agreed upon, the bid security so deposited shall also be suitably extended.

6.12 **Installation and Commissioning Period**

Maximum Installation and Commissioning period is **30 days** from the date of supply(receipt at destination) OR **90 days from the date of issue of Purchase Order whichever is earlier,** failing which the purchaser will have the right to impose penalty for the delay period @ **0.5% per week of the contract value of item/items excluding taxes from the bill amount subject to maximum of 10%.** However, Purchaser/ Registrar has the right to extend the delivery period/commissioning period in special cases.

6.13 **Penalty against Non-Supply/Non-Delivery**

In case of non-supply of Stores within the due date i.e. within the date of delivery the EMD deposited by the bidder shall be forfeited.

6.14 **Rejected items**

No payment shall be made for rejected supplied items. Rejected items must be removed by the bidders within two weeks of the date of rejection at their own cost and replace immediately. In case these are not removed these will be auctioned by the purchaser (at the risk and responsibility of the suppliers) without any further notice.

6.15 **Annual Maintenance Contract**

The Cost of Annual maintenance contract for next 3 years after warranty period shall be submitted as per the **Annexure at I(b)**. The after sales service during and after the warranty / guarantee period should be available from companies own engineers.

6.16 Jurisdiction of the Court

The Purchaser and the Supplier shall agree that the competent Court at Sambalpur shall have the jurisdiction to try and decide any dispute arising between the two parties, and they may approach the Competent Court at Sambalpur if required at any time.

REGISTRAR
VSSUT, Burla

ANNEXURE-I (a)

PRICE SCHEDULE (ITEM WISE)PRICE SCHEDULE (ITEM WISE)

Item Serial No	Item Description	Country of origin with make& model	Quantity & Unit									
				Exwarehouse/ Ex-showroom/ Off-the-shelf (a)	Excise duty/Costum duty, if any (b)	Packing & Forwarding (c)	Inland transportation, insurance and other local csts incidental to delivery (d)	CST/ Entry tax, if any (e)	**Unit price** (a+b+c+d+e)	**GST (f)**	**Any other**	**Total Price (a+b+c+d+e+f)**

ANNEXURE-I (b)

PRICE SCHEDULE (ITEM WISE) - B
PRICE SCHEDULE FOR ANNUAL MAINTANCE CONTRACT AFTER COMPLETION OF WARRANTY PERIOD.

Sl.No	Brief description of Goods Total annual	Quantity in nos.				Annual Maintenance Contract cost 3 years i.e. 3x (4a+4b+4c)	
1	2	3	4			5	
			1st yr.	2nd yr.	3rd yr.		
			(a)	(b)	(c)		

** After Completion of warranty period3** Note:-**

1. In case of discrepancy between unit price and total prices, THE UNIT PRICE shall prevail.

2. The cost of Annual Maintenance Contract (AMC) which includes preventive maintenance including testing & calibration as per technical/ service/ operational manual, labour and spares, after satisfactory completion of warranty period may be quoted for next 3 years on yearly basis for complete equipment and turnkey (if any).
3. The cost of AMC may be quoted along with taxes applicable on the date of bid opening. The taxes to be paid extra, to be specifically stated. In absence of any such stipulation the price will be taken inclusive of such taxes and no claim for the same will be entertained later.
4. Cost of AMC will not be added for Ranking/Evaluation purpose. However, the cost of AMC for lowest evaluated bidder is subject to negotiation.
5. The payment of AMC will be made as per payment terms of the bid document.
6. The uptime warranty and down time penalty shall be as per the bid document.
7. All software updates should be provided free of cost during AMC period.
8. The stipulations in Technical Specification will supersede above provisions.
9. The supplier shall keep sufficient stock of spares require during Annual Comprehensive Maintenance Contract period. In case the spares are required to be imported, it would be the responsibility of the supplier to import and get them custom cleared and pay all necessary duties.

Place:
Date:

Signature of Bidder
Business Address
Seal of the Bidder

ANNEXURE-II

WARRANTY MAINTENANCE CONTRACT AGREEMENT.

THIS AGREEMENT made the.....day of ....., 20___ between the **"The Registrar, Veer Surendra Sai University of Technology, Burla"** (hereinafter "the Purchaser") of the one part and M/s..... (hereinafter called "the Supplier") of the other part:

WHEREAS the Purchaser invited bids for certain Goods & ancillary services viz, supply and commissioning of the instruments & equipment at VSSUT, Burla, Sambalpur, Odisha including Comprehensive Warranty Maintenance Services and has accepted a bid by the Supplier for the instruments & equipment specified below at the Consignee site including Comprehensive Warranty maintenance Services for a period of 2 (Two) year from the date of installation & commissioning of the instruments & equipment as per award of Contract No..... dated

Name of the Equipment & machineries Qty

(To be filled in as per details of goods in the award of Contract)

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. Maintenance Services shall consist of Preventive and Corrective maintenance of equipment specified above & will include repair and replacement of parts free of cost.
2. Preventive maintenance, monthly once, which includes:
2.1 Check-up to ensure that device connection is proper, cabling is at proper condition etc.
2.2 Cleaning of the above instruments &equipments and checking the System Performance.
3. The Supplier is to furnish the tentative schedule of the preventive maintenance of Warranty Maintenance Contract (WMC) to be carried out.
4 The parts replaced must be new parts or equivalent in performance to new parts.
5. The Supplier will also provide the same maintenance service in case of the movement of equipment from the place of original installation to a different place or location, if the equipment is shifted by the Purchaser to another place or location at the cost and risk of the purchaser.
6. Any complaint informed through telephone must be acknowledged with a Complaint No. by the Supplier which will be noted by Consignee. All further contact with the Supplier on such complaint will be initiated through that Complaint No. Once rectification done, that No. will be cancelled by both parties. A register is to be maintained by the Supplier where complaints are to be noted along with Complaint No.
7. The maintenance shall normally be done at the earliest.
8. The Service Engineer of the Supplier will be allowed to handle the respective plant & machineries only in presence of the officer in charge at the Consignee site.

9. The Supplier should ensure that maintenance job is not hampered/delayed due to paucity of spares/inadequate manpower etc.
10. The Supplier should submit the services call report, to the Consignee for each service call without fail.
11. The Supplier evaluation data format for the WMC of Consignee systems may be filled up for necessary action.
12. All formats after filled up should be signed at the end of each page by the Supplier.
13. After completion of the work/repair/maintenance, the Purchaser shall issue a certificate of completion to the supplier to that effect.

Signature	Signature
For the Purchaser	For the Supplier
Name:	Name:
Designation:	Designation:
Address:	Address:
Telephone No:	Telephone No:

ANNEXURE-III

MANUFACTURES' AUTHORISATION FORM

No._____/ Date _____/

To

The Registrar,
VSSUT Odisha
Burla, Sambalpur.

Dear Sir, Bid No._____

We _____who are established and reputable manufacturers of _____having factories at _____ _____ (Address of Factory) do thereby authorize M/s._____ (Name and address of Agent) to submit a bid and sign the contract with you against the above bid.

* No company or firm or individual other than M/s._____ are authorized to bid and conclude the contract in regard to this business against this specific invitation for bid.

We hereby extend our full guaranty and warranty as per general conditions of contract for the goods and services offered by the above firm against this bid.

Yours faithfully,
(Signature for and on behalf of Manufacturers)

Note: This letter of authority should be on the letterhead of the manufacturer and should be signed by a person, competent and having the power of attorney to bind the manufacturer. It should be included original by the Bidders in its bid.

- This para should be deleted for simple items where manufacturers sell the product through different stockiest.
- The Supplier/Managing Director of the Company (if the supplier is a Company) or the Power of Attorney Holder having specific power to sign the contract can only sign the contract/execute the agreement.

ANNEXURE-IV

DETAILS OF THE BIDDERS

Bid Reference No.
Name and address of the Bidder:

01 Name of the bidder (Director/ Managing Director/ Proprietor of the firm)
- a) Full postal address
- b) Full address of the premises
- c) Telephone number
- d) Fax number
- e) E mail:
- f) PAN No
- g) TIN No

02 Total annual turn-over (value in Rupees) with proof
03 Quality control arrangement details
04 Test certificate held
- a) Type test
- b) BIS/ISO certification
- c) Any other

05 Details of staff
- a) Technical
- b) Skilled
- c) Unskilled

06 Branch Office/ Contact Person/ Liaisoning Office in Odisha.
- a) Address
- b) Telephone No.
- c) e-mail,
- d) Fax

Signature and seal of the Bidder

ANNEXURE-V-1

Technical details of the Equipment (Table No.1 Sl.No.1: BLDC Set) to be supplied by the bidder

S/N	University's Required Technical Specifications	Pre-Populated Parameter Baseline	Bidder's Offered Specification (Make & Model)	Compliance Status (Yes / No)	Deviation, if any (with technical justification)	Exact Page No. of Proof in Bidder's Catalog
1	COMPONENT A: RESEARCH-GRADE BLDC GENERATOR					
1.1	Power Capacity & Operating Voltage	3.7 kW (5 hp mechanical equivalent), 240V AC Line-to-Line (RMS) at rated speed				
1.2	Rotor Profile & Back-EMF Waveform	4-Pole permanent magnet rotor optimized for highly stable trapezoidal back-EMF / terminal voltage profile				
1.3	Stator Connection & Termination	Star (Y) connected with the Neutral point explicitly brought out to an external heavy-duty 40 A terminal box				
1.4	Frequency & Speed Synchronization	Nominal fundamental frequency of 50 Hz at a rated synchronous speed of 1500 RPM				
1.5	Phase Balance & Armature Regulation	Balanced 3-phase output across all operating ranges with low research-tolerance voltage drop from no-load to full-load				
2	COMPONENT B: PRIME MOVER (INDUCTION MOTOR)					
2.1	Power Capacity & Phase Input	5.5 kW (7.5 hp), 415 V AC Line-to-Line, 3-Phase, 50 Hz				
2.2	Construction & Stator Topology	Squirrel Cage type, 4-Pole configuration with a Delta (Δ) connected stator winding				
2.3	Thermal Documentation	Submit a certified 24-hour temperature-rise test report conducted at full rated load prior to dispatch				
2.4	Insulation & Duty Cycle	Continuous Duty (S1 rating) using Class F insulation limited strictly to Class B temperature rise limits				
3	FEEDBACK, COUPLING & MECHANICAL INTEGRATION					

3.1	High-Resolution Instrumentation	Integrated high-accuracy optical or magnetic incremental rotary encoder providing a resolution of 1024 Pulses Per Revolution (PPR)				
3.2	Shaft Coupling System	Torsionally flexible Tyre-type or Jaw-type coupling precisely aligned				
3.3	Rigid Foundation Baseplate	Heavy-gauge fabricated structural steel baseplate with integrated anti-vibration pads/mounts				
3.4	Mechanical Safety Guarding	Fully enclosed, heavy-duty safety guarding surrounding the coupled shaft assembly				
3.5	Integrated Thermal Management	Equipped with active/passive cooling system configured for continuous operation				

ANNEXURE-V-2

Technical details of the Equipment (Table No.1 Sl.No.2: SEIG Set) to be supplied by the bidder

S./N.	University's Required Technical Specifications	Pre-Populated Parameter	Bidder's Offered Specification (Make, Model & Rating)	Compliance Status (Yes / No)	Deviation, if any (with technical justification)	Exact Page No. of Proof in Bidder's Catalog
1	COMPONENT A: SEIG GENERATOR					
1.1	Power Capacity & Operating Voltage	3.7 kW (5 hp), 240V AC Line-to-Line, 3-Phase				
1.2	Connection & Neutral Output Box	Star (Y) connected with explicit 40 A external neutral terminal box				
1.3	Harmonics Compliance	Total Harmonic Distortion (THD) < 5%, IEEE 519 compliant				
1.4	Core Material Engineering	Rotor core built with high-retentivity silicon steel laminations				
1.5	Over-speed Capability	Sustained over-speed testing capability up to 1650 RPM or higher				
2	COMPONENT B: PRIME MOVER					
2.1	Power Capacity & Phase Input	5.5 kW (7.5 hp), 415 V AC Line-to-Line, Delta connected				
2.2	Inverter-Duty Thermal Protection	Inverter-Duty rated (high dv/dt protection) with 3x embedded PTC/PT100 sensors				
2.3	Dynamic Performance Torque	Breakdown torque capability of 200% to 250% of rated torque				
3	COMPONENT C: VFD PERFORMANCE					
3.1	Power Capacity & Overload Profile	7.5 kW (10 hp), 415V AC, 3-Phase, min 150% overload for 60 seconds				
3.2	Control Scheme & Braking Chopper	Sensorless Vector Control (SVC) + integrated internal dynamic braking chopper & resistor				
3.3	RCP / HIL Integration Channel	External, electrically ISOLATED 0 to 10 V DC Analog input channel				
4	SYSTEM INTEGRATION ASSEMBLY					
4.1	Common Foundation Layout	Fully integrated on a common structural steel bedplate with vibration isolation mounts				

ANNEXURE-V-3

Technical details of the (Table.No.1 Sl.No.3: PMSG Set) to be supplied by the bidder

S/N	University's Required Technical Specifications	Pre-Populated Parameter Baseline	Bidder's Offered Specification (Make & Model)	Compliance Status (Yes / No)	Deviation, if any (with technical justification)	Exact Page No. of Proof in Bidder's Catalog
COMPONENT A: RESEARCH-GRADE THREE-PHASE PMSG						
1.1	Power Capacity & Operating Voltage	3.7 kW continuous electrical output, Rated 3-phase 240 V AC Line-to-Line (RMS) at rated speed of 1500 RPM synchronous speed at 50 Hz.				
1.2	Stator Connection & Termination	All six (6) stator winding terminals brought out and clearly labeled in the terminal box (IP20) to allow external user-configurable Star (Y) or Delta connections.				
1.3	Current Rating & Hardware	Full load current of approx. 11 A RMS at 0.8 PF or greater for Star connection. Hardware & lugs rated for min continuous line current of 20 A.				
1.4	Rotor Profile & Output Waveform	Optimized rotor magnet arrangement using high-energy NdFeB permanent magnets for a balanced, symmetrical, sinusoidal output. THD compliant with IEEE 519 limits up to full load.				
1.5	Voltage Regulation	Voltage Regulation from No-load to full rated load must be within 10% to 15%.				
1.6	Enclosure & Mechanical Build	Rugged Cast Iron frame, Single shaft extension on the drive end (DE), Low acoustic noise emission.				
COMPONENT B: PRIME MOVER (THREE-PHASE INDUCTION MOTOR)						
2.1	Rating & Input Voltage	Three-Phase Induction Motor of 5.5 kW (7.5 hp) continuous output, 415 V AC Line-to-Line, 3-Phase, 50 Hz.				
2.2	Rotor Profile & Poles	Squirrel Cage rotor, 4-Pole (nominal full-load operating speed 1440–1470 RPM).				
2.3	Insulation & Stator Architecture	Delta connected stator winding (6-terminal block brought out to an IP20 terminal box). Rated as an Inverter-Duty motor to withstand high dv/dt voltage spikes; low-inertia rotor.				
COMPONENT C: MECHANICAL COUPLING, THERMAL & INSTRUMENTATION						
3.1	Shaft Coupling	Torsion ally resilient, high-alignment Tyre-type or Elastomeric Jaw-type coupling.				

3.2	Thermal Duty & Insulation	Rated for Continuous Duty 24-hour operation (Full load). Class H insulation system with Class F temperature rise limits for both machines.				
3.3	Cooling System	Integrated bi-directional internal shaft-mounted cooling fans on both machines alongside external frame cooling fins.				
3.4	Feedback Sensor	Industrial-grade incremental rotary Speed Encoder providing 1024 Pulses Per Revolution (PPR), fixed at Non-Drive End (NDE) of IM. Should use differential line-driver signaling for EMI protection.				
3.5	Base plate & Safety Auxiliaries	Heavy-gauge fabricated structural steel common bedplate, anti-vibration mount pads, coupling guard/cover.				
COMPONENT D: 10 HP VARIABLE FREQUENCY DRIVE (VFD)						
4.1	Capacity & Frequency Limits	7.5 kW (10 hp), 415 V AC, 3-Phase input (±10% tolerance). Overload rating of min 150% current for 60 seconds. Output frequency range from 0.5 Hz up to 60 Hz.				
4.2	Control Modes	Selectable open-loop Sensor less Vector Control (SVC) and programmable multi-point V/f curves, optimized for Constant Torque regions.				
4.3	Braking Subsystem	Integrated internal dynamic braking chopper unit matched to an external dynamic braking resistor in a ventilated cage; rated for min 10% continuous braking duty cycle.				
4.4	Control Interface & HIL / RCP Interfacing	Integrated/removable alphanumeric keypad. Dual speed reference: Local manual &External isolated 0 to 10 V DC Analog input channel for remote speed tracking via Real-Time Processor (RCP/HIL). Includes digital I/O & status relays.				
4.5	Enclosure & Factory Reports	Wall-mountable IP20 enclosure panel with pre-wired, labeled terminal blocks segregating power, braking loops, and low-voltage control circuits. Supply of standard Factory Test Reports prior to dispatch.				

ANNEXURE-V-4

Technical details of the (Table.No.1 Sl.No.4: Micro generator Set) to be supplied by the bidder

S/N	University's Required Technical Specifications	Pre-Populated Parameter Baseline	Bidder's Offered Specification (Make & Model)	Compliance Status (Yes / No)	Deviation, if any (with technical justification)	Exact Page No. of Proof in Bidder's Catalog
COMPONENT A: PRIME MOVER & GENERATOR COUPLING						
1.1	Engine-Generator Integration	Direct, inline mechanical coupling of a 6 kW minimum rated Diesel Engine to a 3.7 kW Brushless Synchronous Generator.				
1.2	Duty Cycle & Waveform Quality	Rated for Continuous Duty (S1) full-load operation. Sinusoidal output with Voltage THD ≤ 5.0% up to full balanced load, verified by factory test reports.				
1.3	Enclosure Framework	Housed entirely in a standard indoor IP20 framework layout.				
COMPONENT B: ELECTRICAL SPECIFICATIONS (GENERATOR & AVR)						
2.1	Electrical Output Parameters	3.7 kW output capacity at 0.8 lagging PF, 240 V AC Line-to-Line (L-L), 3-Phase, 4-Wire configuration, delivering 11 A continuous output current.				
2.2	Excitation & Voltage Regulation	Brushless, self-excited system with standard industrial Automatic Voltage Regulator (AVR) maintaining voltage regulation within ±1.0% from no-load to full-load.				
2.3	Harmonic Suppression Pitch	Standard 2/3 (two-thirds) winding pitch design to naturally suppress the 3rd harmonic and triplen harmonic currents.				
2.4	Insulation & Termination	Class F minimum insulation with a Class B temperature rise limit. Terminal box layout must be IP20 rated with heavy-duty terminal blocks.				
COMPONENT C: MECHANICAL SPECIFICATIONS (DIESEL ENGINE & GOVERNOR)						
3.1	Mechanical Power Rating	Minimum 6.0 kW continuous shaft power output from the diesel engine.				
3.2	Speed Governance Control	Electronic Governor supporting Class A1 governing speed control standard (ISO 8528-5) to maintain tight frequency limits during load steps.				

3.3	Engine Starting System	Standard 12V/24V DC electric key-start or push-button, manual engine control module, integrated charging alternator, and matched maintenance-free battery.				
3.4	Machine Thermal Cooling	Natural/forced-air cooling via high-efficiency internal cooling fans mounted on the rotor shafts of both machines + frame cooling fins.				
COMPONENT D: INSTRUMENTATION & DIGITAL INTERFACE						
4.1	High-Resolution Speed Feedback	High-accuracy, industrial-grade incremental rotary encoder providing 1024 Pulses Per Revolution (PPR) mounted on the non-drive end (NDE) of the shaft.				
4.2	Signal Protocol & HIL Integration	Differential Line Driver outputs (RS-422 standard) for EMI noise immunity, pre-wired for direct integration into the dSPACE Micro Lab Box II system.				
COMPONENT E: STRUCTURAL, FOUNDATION, & SAFETY AUXILIARY SYSTEMS						
5.1	Integrated Base plate Foundation	Precision-machined, heavy-gauge fabricated structural steel common bedplate accommodating engine and generator to prevent deflection.				
5.2	Dampening & Transmission	High-damping elastomeric anti-vibration pads (AVMs). Torsionally flexible, high-alignment Tyre-type or Jaw-type coupling.				
5.3	Safety Guarding & Interlocks	High-visibility, removable steel safety coupling guard enclosing rotating components, complete with a safety interlock sensor.				

ANNEXURE-V-5

Technical details of the (Table No.1 Sl.No.5: 3 phase, 10kVA Multi tapping transformer) to be supplied by the bidder

Sl.No	University's Required Technical Specifications	Pre-Populated Parameter Baseline	Bidder's Offered Specification (Make & Model)	Compliance Status (Yes / No)	Deviation, if any (with technical justification)	Exact Page No. of Proof in Bidder's Catalog
NOMINAL ELECTRICAL PARAMETERS & WINDING CONFIGURATION						
1.1	Transformer Type & Capacity	Custom designed, Dry-Type, Multi-Tapping, Natural Air-Cooled (AN) Three-Phase Neutral Current Compensation Isolation Transformer. Nominal Rating: 10 kVA continuous duty.				
1.2	Winding Topology & Turns Ratio	Total of six (6) independent 200 V windings (exactly two matched windings per phase) providing a physical turns ratio of 1:1.				
1.3	Topology Integration & Compensation	Terminal connections must support external link strapping to execute a Delta-Star topology engineered for zero-sequence neutral-current compensation on a 240 V Line-to-Line (L-L) system.				
1.4	Zero-Sequence Impedance	Design must yield a low zero-sequence impedance of less than 5.0% to guarantee effective neutral current stabilization.				
MAGNETIC CORE & CORE MATERIALS						
2.1	Core Structure & Grade	Three-limb core topology using high-permeability, low-loss CRGO Silicon Steel, minimum grade M3 or better with lamination thickness less than 0.27 mm.				
2.2	Core Surface Insulation	High-integrity carlite or multi-layer inorganic surface insulation to suppress Eddy current losses.				
2.3	Working Flux Density Limits	High linearity design maintaining working flux density under 1.35 Tesla (T) at nominal voltage, and below 1.50 Tesla (T) during 110% over-voltage transients without saturation.				
WINDINGS, TAPPINGS, & ELECTRICAL PERFORMANCE						
3.1	Conductor Material & Insulation	High-conductivity, electrolytic-grade 99.9% pure Copper winding wire/strip. Class F minimum insulation system.				
3.2	Intermediate Voltage Tappings	Each of the 6 independent windings must feature precise intermediate taps outputting: 140 V, 160 V, 180 V, 200 V, and 220 V.				

3.3	Waveform Integrity & Regulation	Induced voltage and current distortion factor (THD) less than 2% when connected to an ideal sinusoidal supply source.				
PHYSICAL LAYOUT, TERMINALS, & QUALITY ASSURANCE						
4.1	Terminal Block Rating & Coding	Heavy-duty, continuously rated 40 A to 63 A IP20-shielded terminal blocks explicitly featuring permanent RYB (Red-Yellow-Blue) color coding.				
4.2	Enclosure & Mobility	Floor-mounted, robust sheet-metal open-ventilated panel with standard indoor IP20 rating, mounted on heavy-duty swivel castor wheels with independent foot brakes.				
4.3	Certified Quality Documentation	Delivery of a certified factory test sheet validating No-Load Core Losses (W), Full-Load Copper Losses (W) referenced at 75°C, and standard temperature-rise profiles.				



ANNEXURE-V-6

Technical details of the (Table No.1 Sl.No.6: 3 phase, Multi-tapping inductors) to be supplied by the bidder

S/N	University's Required Technical Specifications	Pre-Populated Parameter Baseline	Bidder's Offered Specification (Make & Model)	Compliance Status (Yes / No)	Deviation, if any (with technical justification)	Exact Page No. of Proof in Bidder's Catalog
NOMINAL ELECTRICAL PARAMETERS SPECIFICATIONS						
1.1	Inductor Configuration & Type	Custom-engineered, Dry-Type, Multi-Tapping, High-Linearity Three Phase Power Inductor or Single-Phase Power Inductor (3 numbers of Reactors).				
1.2	Nominal Ratings	250 V AC working voltage, 40 A continuous RMS current rating at a fundamental frequency of 50 Hz.				
1.3	Winding Taps Breakdown	Single continuous multi-tap winding per phase execution, with taps at: 0.125 mH, 0.25 mH, 0.5 mH, 1.0 mH, 2.0 mH, 2.5 mH, 4.0 mH, 5.0 mH, 8.0 mH, 10.0 mH.				
1.4	Inductance Value Tolerance	Operational inductance variance within ±5.0% for all specified range.				
MAGNETIC CORE MATERIAL & GAPPING SPECIFICATIONS						
2.1	Core Material & Thickness	High-permeability, low-loss CRGO Silicon Steel, Lamination Parameters: 0.27 mm and 0.30 mm thickness with insulation coating.				
2.2	Core Design & Flux Limits	Air-Gapped Core Design, Magnetic Flux Density Limits: 1.2 Tesla (T) at maximum voltage and current.				
2.3	Saturation Curve Linearity	Linear B-H curve with Zero magnetic saturation up to a 70 A peak current impulse.				
WINDINGS, TERMINALS, & ELECTRICAL PERFORMANCE						
3.1	Conductor & Insulation System	High-conductivity, electrolytic-grade 99.9% pure Copper winding, Class F minimum insulation system.				
3.2	Harmonic Profile Waveform	Voltage and current THD below 2.0% when supplied from a sinusoidal source.				
3.3	Termination Subsystem	Heavy-duty, high-conductivity continuous rating IP20 terminal blocks of at least 63 A to reliably handle 70 A peak transients without heating.				
THERMAL, ENCLOSURE, & PHYSICAL AUXILIARY SYSTEMS						

4.1	Cooling & Enclosure System	Natural Air-Cooled (AN), Floor-standing, heavy-gauge sheet steel ventilated industrial enclosure panel rated for standard indoor IP20 service.				
4.2	Mobility Framework	The base structural frame integrated with heavy-duty swivel castor wheels with foot brakes.				
MANDATORY POST-TEST DATA SUBMISSION						
5.1	Laboratory Test Validation	No-Load Core Losses & Full-Load Copper Losses measured/tabulated in Watts (W) at 50 Hz. Validated heat-run test data proving Class F limits under full load.				

ANNEXURE-V-7

Technical details of the (Table No.1Sl.No.7: Inductors (Special Design)) to be supplied by the bidder

S/N	University's Required Technical Specifications	Pre-Populated Parameter Baseline	Bidder's Offered Specification (Make & Model)	Compliance Status (Yes / No)	Deviation, if any (with technical justification)	Exact Page No. of Proof in Bidder's Catalog
NOMINAL ELECTRICAL PARAMETERS SPECIFICATIONS						
1.1	Inductor Core Architecture	Custom-engineered, Dry-Type, Moving-Core (Rotating/Plunger Type) Variable Three-Phase Linear Inductor / Power Reactor housed in a standard indoor framework.				
1.2	Operational Voltage Network	Rated for 415 V AC Line-to-Line (L-L), 3-Phase, 50 Hz utility or experimental source networks.				
1.3	Mechanical Tuning Assembly	Mechanical Rotating Type utilizing a heavy-duty external handwheel or rotating wheel assembly equipped with a positive physical locking lever to firmly secure the air gap position.				
1.4	Inductance Variance Span	Continuously variable inductance spanning from a minimum value of 30 mH up to 300 mH.				
1.5	Fixed Excitation Current (Low Band)	30 mH to 38 mH Range: Handles a full 20 A continuous AC RMS current under a fixed 415 V excitation.				
1.6	Fixed Excitation Current (High Band)	38 mH to 300 mH Range: Current linearly scales down due to impedance to approximately 2.5 A AC RMS at the maximum 300 mH configuration.				
1.7	Calibration & Symmetry Matrix	Delivered with an operational calibration table mapping exact current capacity against inductance. Phase mismatch must remain under 5.0% between any two phases.				
MAGNETIC CORE MATERIAL & LINEARITY SPECIFICATIONS						
2.1	Magnetic Core Composition	High-permeability, low-loss Cold Rolled Grain Oriented (CRGO) Silicon Steel utilizing standard laminations of 0.27 mm to 0.30 mm thickness with surface insulation coating.				
2.2	Magnetic Energy Capacity	Designed to support a peak magnetic energy capability greater than 6 Joules per phase at the minimum inductance maximum current configuration.				

2.3	Linearity Profile & Mechanics	High-linearity performance featuring a linear B-H curve up to 1.5 times the rated current tracking envelope across all mechanical tuning configurations. Precision guide tracks to eliminate magnetic chatter/humming.				
WINDINGS, TERMINALS, & ELECTRICAL PERFORMANCE						
3.1	Conductor Element Grades	High-conductivity, electrolytic-grade 99.9% pure Copper winding elements configured with a Class F minimum insulation system.				
3.2	Coil Accessibility & DC Bias	Stator and rotor coil links for each phase brought out to independent, isolated connection nodes. Windings must safely handle a secondary DC current excitation of at least 15 A at the 100 mH tuning mark.				
3.3	Signal Waveform Distortion	Total Harmonic Distortion (THD) of the induced voltage and current waveforms should remain below 2.0% when supplied from a clean sinusoidal source.				
3.4	Terminal Termination Area	High-current carrying capacity, heavy-duty continuous rating IP20 terminal blocks rated for at least 40 A to support transient loads without heating.				
THERMAL, ENCLOSURE, & PHYSICAL AUXILIARY SYSTEMS						
4.1	Cooling Framework & Frame	Natural Air-Cooled (AN) passive convection framework. Floor-standing, heavy-gauge sheet steel ventilated industrial enclosure panel rated for standard indoor IP20 service.				
4.2	Mobility Features & Visuals	Base structural frame integrated with heavy-duty swivel castor wheels equipped with independent foot brakes. External terminal array featuring permanent RYB color coding.				

ANNEXURE-V-8

Technical details of the (Table No1 Sl.No.8:3-phase 4 leg Voltage Source Converter) to be supplied by the bidder

S/N	University's Required Technical Specifications	Pre-Populated Parameter Baseline	Bidder's Offered Specification (Make & Model)	Compliance Status (Yes / No)	Deviation, if any (with technical justification)	Exact Page No. of Proof in Bidder's Catalog
SYSTEM PERFORMANCE RATINGS						
1.1	Topology & Enclosure	3-Phase, 415 V, 25 kVA Converter System featuring a 3-Phase Diode Input Rectifier integrated with a 3-Phase, 4-Leg (Neutral leg included) IGBT-based Voltage Source Converter/Inverter (VSC) housed in a standard indoor IP20 layout configuration.				
1.2	Input Voltage & Capacity	Input AC Voltage: 3-Phase, 415 V, 50 Hz fundamental frequency. Continuous Output Capacity: 25 kVA nominal, 35 A output AC current.				
1.3	DC Bus Operating Range	Baseline DC link pre-charged to 560 V DC, with an active VSC boost capacity up to 750 V DC maximum.				
1.4	Control & Diagnostics	Optimized for 20 kHz carrier control frequency. Designed for variable frequency drive (VFD) systems and active power filter applications. Must include multiple physical safe waveform observation test points accessible via Oscilloscope (CRO).				
INTERNAL HARDWARE REQUIREMENTS						
2.1	Power Switching Modules	4 × Dual-Switch IGBT Half-Bridge modules (Total 8 switches) rated for >1200V and >150A continuous conduction in a low-inductance housing (62mm footprint or equivalent standard package). Features voltage-controlled MOS input and fast/soft inverse CAL diodes greater than150 A, max Tj= 175°C.				
2.2	Gate Drive Units	4 × Dual-channel plug-and-play gate drivers driving two switches per IGBT module. Must feature 15 V logic input signal level, integrated interlocking dead-time protection (min 2 µs), error reset functionality, active short-circuit protection, and dynamic switching control.				

2.3	Input Rectifier Module	1 × Discrete 3-phase diode bridge rectifier module rated for min 1600 V peak reverse blocking voltage and min 160 A nominal continuous DC load current. Must handle a continuous DC bus input current of at least 38 A.				
2.4	DC Link Capacitors	Total bank capacitance configured using 2 × 4700 µF, 500 V capacitors connected in series (yielding a net 2350 µF / 1000 V capacity), complete with parallel static voltage-balancing resistors.				
2.5	Surge & Thermal Protection	4 × Snubber Capacitors rated for 0.47 µF / 1500 V DC connected directly across the DC link for voltage overshoot mitigation. Includes a thermal trip sensor calibrated to shut down the system at 90°C.				
2.6	Thermal Management Enclosure	Enclosure cooling provided by a 400 mm aluminum heatsink coupled with an internal forced-air cooling fan (powered via single-phase 230 V AC supply) establishing a linear air velocity of 8–10 m/s at a 40°C design ambient rating.				
2.7	Electrical Safety Shielding	All active internal power modules, capacitors, and busbars must be fully housed underneath a transparent polycarbonate protective shield equipped with external safety insulating knobs to prevent accidental shock.				

ANNEXURE-V-9

Technical details of the (Table No.1 Sl.No.9:Three phase 440 V Excitation capacitor) to be supplied by the bidder

S/N	University's Required Technical Specifications	Pre-Populated Parameter Baseline	Bidder's Offered Specification (Make & Model)	Compliance Status (Yes / No)	Deviation, if any (with technical justification)	Exact Page No. of Proof in Bidder's Catalog
NOMINAL RATINGS & CONFIGURATION BANDS						
1.1	System Voltage & Phase	Power Capacitor bank, 3-phase, 440V AC, 50Hz grid/experimental excitation source configuration.				
1.2	Segmented kVAR Blocks (i - iii)	Multi-tier configuration comprising: 0.25 kVAR (3 units), 0.5 kVAR (3 units), and 1.0 kVAR (3 units).				
1.3	Segmented kVAR Blocks (iv - vi)	Higher capacity tiers comprising: 2.0 kVAR (3 units), 5.0 kVAR (3 units), and 7.5 kVAR (3 units).				
1.4	Equivalency Clause Alignment	Nearest standard industrial equivalent rating may be supplied if exact kVAR configurations are unavailable in standard manufacturing catalogues.				
DIELECTRIC MATERIAL & SAFETY ARCHITECTURE						
2.1	Dielectric Technology	Heavy-duty, gas-insulated or dry resin-filled Metallised Polypropylene (MPP) film layout featuring robust self-healing characteristics.				
2.2	Internal Protection	Every individual 3-phase unit must incorporate an integrated internal overpressure disconnector mechanism.				
2.3	Discharge Safety Control	Built-in premium discharge resistors across all terminals to automatically bleed residual voltages down below 50 V within 60 seconds of isolation.				
WINDINGS, ENCLOSURE, & INTERFACING						
3.1	Terminals & Step-Switching	Heavy-duty, finger-safe IP20 terminal connectors rated for up to 32 A continuous. Front panel equipped with heavy-duty rotary selection switches or industrial contactors.				
3.2	Enclosure & Ventilation Class	Floor-standing or benchtop-ready rigid sheet-steel enclosure finished with anti-corrosive powder coating under an IP20 ventilation class footprint.				
3.3	Mobility & Node Coding	Fitted with swivel castor wheels featuring independent foot locks. Interface panel displays permanent, highly visible RYB color-coded connectors for every tier.				

Signature and seal of the Bidder

ANNEXURE- VI

DETAILS OF SIMILAR EQUIPMENT SUPPLIED IN LAST 5 YEARS

Sr. No.	Name of the Project/Equipment/	Brief Technical Specification	Cost of the Product/Equipment	Date of Installation and commissioning as per contract	Name of organization and Address/telephone number of officer of the purchaser to whom reference may be made	Remarks

Signature and seal of the Bidder