

INDIAN INSTITUTE OF TECHNOLOGY GOA

At Goa Engineering College Campus

Farmagudi, Ponda, Goa 403401

E-mail: purchase@iitgoa.ac.in

GSTIN: 30AABAI1653D1ZF

PAN: AABAI1653D

TAN: BLRI08261B

Enquiry No: IITGOA/2018-19/121

Date: 08/03/2019

IIT Goa invites sealed quotations in two bid form for the supply of below mentioned item.

Sl. No.	Description of Item	Qty
1	100 KVA MODULAR UPS with Initial capacity of 40 KVA. (Detailed Specifications Attached)	01 No.

Terms and conditions:

1. Quotation must be valid for at least 90 days.
2. The GSTIN should invariably be mentioned in your offer.
3. Kindly attach a compliance certificate along with the technical quote.
4. Prices:

I) For Import Supplies:

- a) It is mandatory to quote price in CIF/CIP Goa basis only with separate cost breakup.
- b) In case of Multiple options of same product, bidders are requested to quote only one best option and not multiple options.
- c) All local taxes, customs duty and clearance charges will be borne by the Institute as applicable.
- d) Payment terms: 90% payment by letter of credit and balance 10% will be paid by wire transfer after satisfactory installation and commissioning.

II) For Indigenous Supplies:

- a) In case of Multiple options of same product, bidders are requested to quote only one best option and not multiple options.
 - b) Payment terms: Within 30 days after the delivery and installation of the item at IIT GOA.
5. Delivery and installation should be made within 4-6 weeks of getting a confirmed order.
 6. The suppliers shall provide the banking details along with their quote on their letterhead duly signed and stamped.

7. IIT Goa reserves the right to accept and/or reject any/all bids without assigning any reason.
8. Quotations shall be submitted in two parts;
 - 1) **Part – I (Technical)** should contain all the technical details and specification of the product. It should contain unpriced bid along with terms and conditions, proprietary certificates (if applicable). This envelope should be marked as “Technical Bid”. This envelope should also contain the following:
 - a) A cover-sheet of compliance with the stated technical specifications/requirements should clearly be attached. Any deviation to be clearly mentioned.
 - b) At least one Purchase Order (PO) and corresponding installation report for UPS (modular or otherwise) of capacity 20 KVA or above.
 - c) Bidder should be ISO certified and necessary certificate to be attached.
 - 2) **Part -II (Financial)** The financial bid of the above item should be in a sealed envelope marked as “Financial Bid” and should contain financial terms and conditions.
9. **Pre-Bid Submission Meeting** for site inspection is planned on March 18 (Monday) at 11 AM. Please confirm attendance by email to sysad@iitgoa.ac.in, if bidder wishes to attend.
10. For any clarification, you may kindly contact Mr. Raghavendra Y. K. (e-mail: sysad@iitgoa.ac.in) and Stores & Purchase Department (email: purchase@iitgoa.ac.in) till 22/03/2019.
11. All sealed quotations must reach to the Assistant Registrar (Stores & Purchase), IIT Goa, at Goa College of Engineering Campus, Farmagudi, Ponda, Goa by 17.00 Hrs on or before 29th March, 2019”.

Sd/-

Asst. Registrar (S&P)

Annexure - I

Specifications for SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF 100KVA UPS

A. GENERAL REQUIREMENTS:

- 1) UPS: A 100KVA Modular & Scalable, static switch, on-line UPS, with 40 KVA initial capacity and DSP (Digital Signal Processing) Technology, Parallel redundancy, unity active power factor technology, 3-ph in 3-ph out, hot-swappable power module consisting of 20 KVA/KW capacity connected in parallel. Make: APC, SCHNEIDER, VERTIV, RIELLO, PILLER, TECHSER or equivalent.
- 2) RACK: Three phase power modules, mains bypass static, protective devices and accessories shall be inside a standard rack enclosure. Rack capacity should be such that minimum two more modules can be added in future, so that the UPS shall be expandable by paralleling additional modules of the same rating, to provide for module redundancy or load growth requirements.
- 3) BATTERY: The UPS batteries should be of 12V, set of 40 batteries, be able to give 30 minutes' power backup. The capacity and number of SMF batteries shall be calculated and calculation sheet to be provided with the bid. The battery Voltage should be 384/480V DC configurable such that it should work even when 4-8 batteries fail. Batteries to be installed on a suitable MS battery stand, duly painted, size of battery stand shall be designed as per the site condition and availability of space, along with copper battery linking cable, DC cable between UPS to battery bank. DB for battery bank with MCB if separately required need to be provided by the supplier. Make and Warranty: Exide/Amaron/Rocket/Southern make similar to Exide HD series TORR tubular maintenance free battery with battery manufacturer's Standard Warranty of 05 years.
- 4) EARTHING AND COPPER STRIP: Requisite no of chemical earthing pits with 2meter (or more as required) long maintenance free copper earth electrodes along with necessary clamping arrangement, bentonate powder/equivalent conductivity enhancing compound inclusive of excavation for earth pit. Laying of 25 x 5 mm copper strip(30meters or more as required) from earth pit to UPS and UPS panels.

B. UPS TECHNICAL SPECIFICATIONS:

- 1) STANDARDS: The UPS and all associated equipment and components shall be manufactured in accordance with the following applicable standards:
 - Safety Requirements: IEC 62040-1-1, EN 50091-1-1,
 - EMC: IEC 62040-2 (Class A), EN 50091-2 (Class A)
 - Performance: IEC 62040-3 (VFI SS 111), EN50091-3

The above-mentioned product standards incorporate relevant compliance clauses with generic IEC and EN standards for safety (60950), electromagnetic emission and immunity (61000 series) and construction (60146 series and 60529).

The Quality System for the engineering and manufacturing facility certificated to conform to Quality System Standard ISO 9001 or ISO 140001 or ISO 18001. for the design and manufacture of power protection systems for computers and other sensitive electronics. Low magnetic field radiation as per ICNIR.

Necessary certification to be attached.

- 2) MODES OF OPERATION: The UPS shall be designed to operate as an on-line, double-conversion, reverse-transfer system in the following modes:
- a. Normal: UPS inverters continuously powers the critical AC load. The rectifier/chargers derives power from the mains AC power supply source converting this to DC power to supply the inverters, while simultaneously float/boost charging the battery system. Power supplied by the UPS inverters is, to within specified tolerances, at rated voltage and frequency.
 - b. Battery: Upon failure of the mains AC power supply source, the critical AC load is powered by the inverter, which gets, without interruption, power from the battery system. The battery Voltage should be 384/480V DC configurable such that it should work even when 4-8 batteries fail. There shall be no interruption in power to the critical load upon failure or restoration of the mains AC power supply source. Upon restoration of the mains AC power supply source, power to the rectifier initially is restricted by a gradual power walk-in. Following the short power walk-in period, the rectifier powers the inverter and simultaneously recharges the battery through the battery converter. This shall be an automatic function and shall cause no interruption to the critical load.
 - c. Off-Battery or Frequency Converter: When the battery system is taken out of service for maintenance or the UPS is used as a frequency converter, it is disconnected from the battery converter and inverter by means of (an) external disconnect breaker(s). The UPS shall continue to function and meet all of the specified steady-state performance criteria, except for the power outage back-up time capability.
 - d. Bypass: If the inverter fails, or the inverter overload capacity is exceeded, or if the inverter is manually turned off by user, and at this time the inverter is synchronous with the bypass, the static transfer switch shall perform a transfer of the load from the inverter to the bypass source with no interruption in power to the critical AC load. If the inverter is asynchronous with the bypass, the static switch will perform a transfer of the load from the inverter to the bypass with interruption in power to critical AC load. This interruption must be less than 15ms (in 50Hz), or less than 13.33ms (in 60Hz). The static bypass shall be able to support continuously 110% of rated UPS capacity.
 - e. Maintenance: The UPS system should be equipped with an internal maintenance bypass. If the UPS needs to be maintained or repaired, after the inverter is turned off and the load is transferred to bypass, the internal maintenance bypass or external maintenance bypass can be turned on and the UPS can be shut down and the battery can be disconnected for maintenance purposes.
 - f. Paralleling: For higher capacity or higher reliability, power modules can be paralleled inside the UPS rack cabinet; parallel power modules automatically share the load. Each power module shall have its own intelligent control logic to avoid single point of failure. There should not be any common controller that controls all power modules in parallel. Furthermore, to increase capacity or redundancy, UPS modular rack cabinet paralleling can be made. The total load shall be shared by the total number of power modules in the modular rack cabinet. Maximum of two UPS modular rack cabinet can be paralleled (For without Distribution unit).

- 3) SCALABILITY & MODULARITY:

Each UPS rack system shall consist of hot swappable power modules with each module rated for 20 kW and scalable up to minimum more two modules in a rack cabinet. System should support hot swapable and should allow add/remove the modules in working condition without disturbing the connected load. Modularity design of the UPS system shall enable ease of service and upgradability or downgrade-ability of the UPS rack system without interruption to the whole system.

Two (2) UPS system can be paralleled to increase redundancy or capacity (for without distribution unit). Paralleling shall be done with the use of control cables only without any additional external synchronization boxes.
- 4) PERFORMANCE REQUIREMENTS: The UPS is VFI classified (according to IEC 62040-3) producing an output waveform that is independent of both the input supply frequency and voltage.
- 5) UPS MODULE AC INPUT:
 - a. Voltage Range: 305 to 477V
 - b. Frequency Range: 40~70Hz
 - c. Power Walk-In: maximum 30 seconds to full rated input current. Field selectable from 5 to 30 seconds adjustable with 5-second increments.
 - d. Power Factor: Shall be > 0.99 without any option at full rated UPS output load.
 - e. Generator Adaptability: UPS input current limit can be adjusted to suit the generator power rating. Wide input frequency range is permissible.
 - f. Current Distortion: Less than 3% at full rated UPS output load and 100% balanced non-linear load (with input voltage THD \leq 1%).
- 6) UPS MODULE AC OUTPUT:

Three-phase, 4-wire plus ground.

 - a. Load Rating: UPS shall be able to support unity power factor load rating at the specified operating temperature range for any combination of linear and non-linear loads.
 - b. Voltage Stability: 1% steady state for balanced loads, 2% for 100% unbalanced loads.
 - c. Bypass Line Sync Range: Field selectable ± 0.5 to 3.0 Hz at 1.0 Hz increments. Default shall be ± 2.0 Hz
 - d. Frequency Stability: Frequency regulation, whilst free-running on battery, shall be ± 0.05 Hz. If the bypass is available and within limits, even if the UPS is on battery operation, in this case, the output will sync to the bypass. Nominal frequency shall be $\pm 0.05\%$ in single module mode, and 0.25% in parallel mode.
 - e. Frequency Slew Rate: The slew rate shall be 0.6Hz/s.
 - f. Phase Unbalance: $120^\circ \pm 1^\circ$ el. for 100% balanced or unbalanced loads.
 - g. Voltage Transients: $\pm 5\%$ for 100% output load step up or step down.
 - h. Transient Recovery Time: Return to within 5% of steady state output voltage within half a cycle.
 - i. Voltage Distortion (at 400V, 100% rated load):
 - I. Less than 1% total harmonic distortion (THD) for linear loads
 - II. Less than 4% THD for 100% non-linear loads.
- 7) EARTHING: The AC output neutral shall be electrically isolated from the UPS chassis. The UPS chassis shall have an equipment earth terminal. Provisions for local bonding are to be provided.
- 8) UPS DELIVERY SUBMITTALS: The specified UPS shall be supplied with one (1) user manual to include details of:
 - a. Functional description of the equipment with block diagrams.

- b. Detailed installation drawings, including all terminal locations for power and control connections for both the UPS and battery system.
 - c. Safety precautions.
 - d. Step-by-step operating procedures.
 - e. General maintenance guidelines.
- The UPS shall be supplied with a record of pre-shipment final factory test report.

9) WARRANTY:

- a. UPS Warranty: The UPS manufacturer shall warrant the unit against defects in workmanship and materials for a minimum of 12 months from the date of successful completion of Installation work.
- b. Battery Warranty: The battery manufacturer's standard warranty of 5 years to be provided.

10) FABRICATION:

- a. Materials All materials of the UPS Rack System shall be new, of current manufacture, high grade and shall not have been in prior service except as required during factory testing. All active electronic devices shall be solid-state. Control logic and fuses shall be physically isolated from power train components to ensure operator safety and protection from heat. All electronic components shall be accessible from the front. Chassis shall be with Anti-Static paint protection
- b. Wiring practices, materials and coding shall be in accordance with the requirements of IEC. All electrical power connections shall be torqued to the required value and marked with a visual indicator (English tag). Provision shall be made in the cabinets to permit installation of input, output, and external control cabling. Provision shall be made for bottom access, allowing for adequate cable bend radius, to the input and output connections.
- c. Construction: The UPS shall be housed in an IP20 enclosure, designed for floor mounting, with wheels at bottom. The UPS rack shall be structurally adequate and have provisions for forklift handling. Maximum cabinet height shall be 2 meters.

11) EQUIPMENT CONFIGURATIONS: Systems greater than one power module shall operate simultaneously in a parallel configuration with the load shared equally between the connected modules. With the exception of a single module configuration, the system shall be redundant or non-redundant as stated elsewhere in this specification.

- a. Non-redundant system: All the modules making up the UPS system shall supply the full rated load. If a module malfunctions, and that the remaining modules cannot support the load, the load has to be transferred, automatically and uninterrupted, to the bypass line by the use of the internal static mains bypass switch.
- b. Redundant system: the UPS system shall have one or more module(s) than required to supply the full rated load. The malfunction of one of the modules shall cause that module to be disconnected from the critical load and the remaining module(s) shall continue to carry the load. Upon repair of the module, it shall be reconnected to the critical load to resume redundant operation. Any module shall also be capable of being taken off the critical load manually for maintenance without disturbing the critical load bus. Module redundancy level shall be a predefined number of modules that are required to supply the full rated load. With the number of connected modules equal to this value, a malfunction of another module shall cause the load to be transferred automatically and uninterrupted to the bypass line by the use of the static mains bypass switch.

- c. Parallel System: It shall be possible to connect one UPS system, with one or more (up to five power modules) with another UPS with the same configuration for increased capacity or redundancy. All the modules making up the UPS system shall supply the full rated load. If a module should malfunction, and that the remaining modules cannot support the load, the load has to be transferred, automatically and uninterrupted, to the bypass line by the use of the internal static mains bypass switch.

12) SYSTEM PROTECTION: The UPS shall have built-in protection against: surges, sags, and over-current from the AC rectifier input source, over-voltage and voltage surges from output terminals of paralleled sources, and load switching and circuit breaker operation in the distribution system. The UPS rack system shall be protected against sudden changes in output load and short circuits at the output terminals. The UPS shall have built-in protection against permanent damage to itself and the connected load for all predictable types of malfunctions. Fast-acting current limiting devices shall be used to protect against cascading failure of solid-state devices. Internal UPS malfunctions shall cause the module to trip off-line with minimum damage to the module and provide maximum information to maintenance personnel regarding the reason for tripping off line. The load shall be automatically transferred to the bypass line uninterrupted, should the connected critical load exceed the capacity of the available on-line modules. The status of protective devices shall be indicated on a graphic display screen on the front of the unit.

13) STANDARD COMPONENTS:

- a. Rectifier The term rectifier shall denote the solid-state equipment and controls necessary to convert AC to regulated DC for input to the inverter. The rectifier shall be of DSP (Digital Signal Processor) controlled design and utilize insulated gate bipolar transistors (IGBTs).
 - Input Current Total Harmonic Distortion: Less than 3% at full rated UPS output load and 100% balance non-linear load (with input voltage THD \leq 1%).
 - Power factor correction: The rectifier also performs a PFC function; input power factor shall be a minimum 0.99.
 - AC Input Current Limiting: The maximum Input current limit can be reduced at 100% for generator operation.
 - Input Power Walk-in: The rectifier/charger shall provide a feature that limits the total initial power requirements; the power of rectifier will increase gradually and power walk-in time can be set from 5 seconds to 30 seconds (default shall be 10 seconds).
 - Mains AC Input phase sequence reverse protection: Before soft starting of the rectifier, if the phase sequence of the main AC input is reversed, the rectifier will not start and an alarm displayed on the LCD.
- b. Rectifier The term rectifier shall denote the solid-state equipment and controls necessary to convert AC to regulated DC for input to the inverter. The rectifier shall be of DSP (Digital Signal Processor) controlled design and utilize insulated gate bipolar transistors (IGBTs).
 - Input Current Total Harmonic Distortion: Less than 3% at full rated UPS output load and 100% balance non-linear load (with input voltage THD \leq 1%).
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 - Input Power Walk-in: The rectifier/charger shall provide a feature that limits the total initial power requirements; the power of rectifier will increase gradually and power walk-in time can be set from 5 seconds to 30 seconds (default shall be 10 seconds).

- Mains AC Input phase sequence reverse protection: Before soft starting of the rectifier, if the phase sequence of the main AC input is reversed, the rectifier will not start and an alarm displayed on the LCD.
- c. Static Bypass for time when maintenance is required or when the inverter cannot maintain voltage to the load due to sustained overload, current limiting or malfunction, a bypass circuit shall be provided for each single module that forms part of the UPS system. The modular bypass circuit(s) shall provide a path for power directly from an alternate AC (bypass) source. The UPS control shall constantly monitor the availability of the inverter bypass circuit to perform a transfer. The inverter bypass of each module shall consist of a static transfer switch, operating in conjunction with the inverter output static switch. The static switches shall denote the solid-state devices that, operating simultaneously, can instantaneously connect the load to the alternate AC source.
- Automatic Load Transfers: An automatic load transfer between the inverter output and the alternate AC source shall be initiated if an overload or short circuit condition is sustained for a period in excess of the inverter output capability or due to a malfunction that would affect the output voltage. Transfers caused by overloads shall initiate an automatic retransfer of the load back to the inverter only after the load has returned to a level within the rating of the inverter source.
 - Back-feed Protection: Using another optional (customer-supplied) contactor located upstream of the UPS Bypass input and whose trip coil control voltage comes from the input bypass line voltage, the UPS shall provide a normally closed contact to be used for isolating the bypass source to protect the operator against back-feed of energy resulting from a short-circuit of the bypass line SCRs. That is, in the event that the UPS works on Battery mode and no main input (Rectifier and Bypass) is available, the contactor cannot be closed. So if the bypass line SCRs are short-circuited, the UPS will be still disconnected from the Bypass supply.
- d. Man-Machine Interface (MMI)
- UPS Display and Control Panel: Each UPS module shall be equipped with display. This shall automatically provide all information relating to the current status of the UPS as well as being capable of displaying metered values. The display shall be menu-driven, permitting the user to easily navigate through operator screens. The LCD shall be able to store 500 and above historical event records that can be retrieved and reference and diagnosis.
 - Metered Values: An MCU or DSP shall control the display functions of the monitoring system. All three-phase parameters shall be displayed simultaneously. All voltage and current parameters shall be monitored using true RMS measurements for accurate ($\pm 1\%$) representation of non-sinusoidal waveforms typical of computers and other sensitive loads. The following parameters shall be displayed:
 - Main input
 - Three-phase main input line-to-neutral voltage
 - Three-phase main input line-to-line voltage
 - Three-phase main input current
 - Main input frequency
 - Three-phase input power factor
 - Bypass
 - Each phase bypass input line-to-neutral voltage
 - Bypass input line-to-line voltage

- Bypass input frequency
 - UPS output
 - Each phase output voltage of UPS
 - Each phase output current of UPS
 - Output line-to-line voltage of UPS
 - Power factor of each phase
 - UPS output frequency
 - Local load
 - Load of each phase (% of total load)
 - Active power, apparent and reactive power of each phase (output)
 - Load crest factor
 - Battery
 - Battery bus voltage
 - Battery current
 - Forecasted Battery backup time (remaining time)
 - Battery temperature (in degree centigrade)
 - Parallel load
 - Apparent power of each output phase (for parallel operation system)
 - Active power of each output phase (for parallel operation system)
 - Inactive power (Reactive power) of each output phase (for parallel operation system)
 - Input/Output transformer when installed
 - Phase to Neutral (L-N) voltage (V)
 - Phase to Phase (L-L) voltage (V)
- Power Flow Mimic: Each UPS module shall be equipped with a mimic to indicate power flow to the critical load along with an indication of the availability of the rectifier/charger, battery, automatic bypass, inverter, load. The mimic shall provide a quick and easy indication of the load level (displayed on LCD), including for overload conditions (displayed on LCD). This power flow is also shown in the LCD menu.
- Alarms and Status Information: Alarm and status conditions shall be reported at a single module UPS system or at a paralleled module UPS or both. The display and control panel shall report the alarms and status information. Each alarm shall be visually displayed in text form and an audible alarm will sound for each alarm displayed.
- Inverter ON/OFF: Each UPS module shall be equipped with an inverter ON/OFF buttons which will transfer the load from all UPS modules to the bypass mains supply, if it is available. The inverter ON/OFF control shall be protected under menu confirm protect if the bypass mains is not available.
- e. Communication Ports: The UPS shall have input and output volt-free contacts to provide the following interfaces:
- EPO
 - Environment parameter input interface
 - User communication interface

- Intellislot intelligent card interface
- Temperature detection interface

- f. **Software Compatibility:** The UPS shall have software available for monitoring, control and event management through computer. The available solutions shall provide:
- users with basic UPS operating status plus automated shutdown of a computers' Operating System in the event of an extended power outage.
 - cost-efficient, centralized monitoring and event management of UPS, Environmental and Power systems that can utilize an existing network infrastructure.
- g. **LBS (LOAD BUS SYNCHRONIZER):** The objective of the Load Bus Synchronizer (LBS) is to keep the output of two independent UPS systems (either two independent single units OR two independent parallel systems each with and without Main Static Switch) in synchronization even when the two systems are operating on different modes (bypass/inverter) or on batteries. It is usually used with Static Transfer Switches to achieve Dual Bus Power Supply configuration. LBS shall be able to synchronize systems of same type and brand, each system composed of same type and brand paralleled UPS's (with TWO completely different sources of incoming power to UPS systems). With optional LBS adapter it shall be possible to synchronize systems of different type and brand, each system composed of same type and brand paralleled UPS's (with TWO completely different sources of incoming power to UPS systems).

14) COMMUNICATIONS:

- a. **SNMP/HTTP Network Interface Card:** The UPS shall have internally fitted network interface card that will provide real-time status information over an 10/100 base T Ethernet to / for users. The network interface card will support SNMP v1 and v2c. UPS information will also be available over the network via a web browser via an HTTP page. The card supports static as well as DHCP. The card shall also be configurable via the network using the HTTP web page and Telnet session. Configuration properties shall include device naming and specific service enable / disable and control enable / disable. The card provides configuration and control security through a user name and password. The cards firmware can also be update such that future releases can be downloaded to enjoy card enhancements.
- b. **RS-485/RS-232 Interface Card:** The UPS shall have an optional, internally fitted RS232/RS-485 interface card that will provide real-time status information over a 2 or 4-wire RS-485 connection. The RS-485 Interface Card will support ModBus RTU, and JBus.
- c. **Dry Contact Card:** The UPS provides dry contact communication through the dry contact card. The card shall be able to provide four channels of digital signal output to remote site. The contact card shall be able to receive three channels of digital input signal, two of which control the UPS turn on and turn off.

15) **TESTING OF UPS SYSTEM:** The supplier shall have facilities to carry out tests at factory. Standard on-site tests will have to be satisfactorily carried out in presence of IIT Goa officials & certified for the UPS quoted to be supplied in the tender, before acceptance of material. Non-Compliance to tendered specifications during testing shall liable the system for rejection.

The following tests to be conducted on the UPS system.

- I. Standard Factory tests (Reports to be Included)

- a. Full load input variation test. Maximum and minimum accepted voltage by the UPS to be recorded.
- b. Total harmonic distortion. (Voltage test performed at UPS output.
- c. Overload test.
- d. Short circuit protection test. (To be stimulated)
- e. UPS endurance test at 100% load for 8hrs.
- f. Overall efficiency at nominal voltage.
- g. Inverter efficiency.
- h. Back up test, UPS to be tested at full load on battery for 30mins.

II. On-site tests.

- a. Voltage ripple at battery terminal.
- b. Static bypass.
- c. Back up test. UPS to be tested at actual available load on battery for 30mins.

16) COMPREHENSIVE AMC:

- a. The UPS to be provided with a comprehensive AMC of 5 years, after expiry of warranty period. Annual chargeable rate for the same to be quoted separately in the price bid.
- b. Payment will be made quarterly after successful completion of AMC work for the billing period against submission of bill.
- c. It is a comprehensive AMC which includes all parts, labour, transport etc. for the above mentioned UPS. The contractor shall replace or repair any parts or components which are found defective of the UPS.
- d. Considering the modular UPS, a breakdown of the entire UPS system is NOT EXPECTED & WILL NOT BE ACCEPTED. However, if any module breakdown then, service person should attend the UPS complaint within 24 hrs and rectify the same from launching of complaint on phone or email. Costs of spares to be replaced in the UPS system shall be covered under this Comprehensive Annual Maintenance Contract.
- e. During this contract period a Service Engineer shall visit IIT Goa on regular basis for check-up of the above mentioned UPS system and DC standby sources (battery banks) once in every 03 months apart from the breakdown calls and submit the visit reports.
- f. The service engineer shall bring necessary tools and instruments required for servicing the UPS. Along with vacuum cleaner/Blower required for cleaning the UPS cubicle along with necessary manpower.
- g. The above stated maintenance clause is applicable even during the warranty period.