PART 1 - TECHNICAL BID

TENDER FOR
Supply of UPS & Batteries to State Bank of India
FI & MM – RBO/DSH/RACC

STATE BANK OF INDIA
LOCAL HEAD OFFICE, PREMISES & ESTATE DEPARTMENT
ST. MARK’S ROAD BENGALURU
STATE BANK OF INDIA
NOTICE INVITING TENDERS.

Notice Inviting Tenders No. P&E/001 DATED 19/05/2020

State Bank of India, P&E Department, #65, St.Mark's Road, Local Head Office Bengaluru-560001, invites two-bid E-tenders from empanelled UPS supply & service providers who have own office and service facility in Karnataka and having service and maintenance facility across Karnataka state for supply installation testing, commissioning and AMC of UPS systems and Batteries to various Offices across Karnataka State. Eligible empanelled suppliers can download this whole tender from the website https://etender.sbi/SBI from 19/05/2020 to 29/05/2020 up to 2.00 PM.

For any details contact (Mobile) 9036268101

Details of tenders are as under:

<table>
<thead>
<tr>
<th></th>
<th>Name of Items</th>
<th>Supply of UPS &amp; Batteries to State Bank of India FI &amp; MM – RBO /DSH/RACC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Quantity</td>
<td>As per BOQ</td>
</tr>
<tr>
<td>3</td>
<td>Delivery &amp; Installation Location</td>
<td>Across Karnataka State</td>
</tr>
<tr>
<td>4</td>
<td>Time allowed for completion</td>
<td>2 WEEKS from the date of issue of work order</td>
</tr>
<tr>
<td>5</td>
<td>Earnest Money Deposit (to be submitted in the form of DD shall be drawn in favor of “SBI LHO Bengaluru” payable at Bengaluru)</td>
<td>Rs 47,000/- EMD shall be submitted to SBI LHO P&amp;E Department along with hard copy of duly signed technical bid in a sealed envelope by 3.00 p.m. On 29/05/2020. Tenders not accompanied by EMD shall be summarily rejected</td>
</tr>
<tr>
<td>6</td>
<td>Security Deposit</td>
<td>5% of the contract including EMD and ISD.</td>
</tr>
<tr>
<td>7</td>
<td>Cost of tender documents</td>
<td>Nil</td>
</tr>
<tr>
<td>8</td>
<td>Last date and time of receipt of technical bids and indicative price bid.</td>
<td>3.00 p.m on 29/05/2020. The tenders are to be submitted through E-tendering platform: <a href="https://etender.sbi/SBI">https://etender.sbi/SBI</a></td>
</tr>
<tr>
<td>9</td>
<td>Date and time of opening of tenders.</td>
<td>5.00 p.m on 29/05/2020.</td>
</tr>
<tr>
<td>10</td>
<td>E-bidding to be facilitated by</td>
<td>M/s. e-Procurement Technologies Ltd., Ahmedabad, on behalf of State Bank of India</td>
</tr>
<tr>
<td>11</td>
<td>Address for online submission of bids (technical as well as commercial bids)</td>
<td>Bid must be submitted online on <a href="https://etender.sbi/SBI">https://etender.sbi/SBI</a></td>
</tr>
<tr>
<td>12</td>
<td>Contact Details of M/s. e-Procurement Technologies Ltd.(ETL), Ahmedabad</td>
<td>9081000427, 9904407997 079-68136857, <a href="mailto:sujith@eptl.in">sujith@eptl.in</a> <a href="mailto:ekta.m@eptl.in">ekta.m@eptl.in</a> / Phone: +91 96 24 990356 / 9081000427 / 9904407997 <a href="mailto:jainam@eptl.in">jainam@eptl.in</a></td>
</tr>
<tr>
<td>13</td>
<td>Defects Liability Period</td>
<td>12 months.</td>
</tr>
<tr>
<td>14</td>
<td>Validity of Offer</td>
<td>60 days.</td>
</tr>
<tr>
<td>15</td>
<td>Any additional Information</td>
<td>Electronic payment shall be preferred. All the contractor/suppliers must furnish details such as 1) Name of the their bank 2) Name of their branch 3) Account number 4) Name of the account holder as in the bank account 5) IFSC No of the branch 6) PAN number.</td>
</tr>
</tbody>
</table>

This bid document is not transferable

In case the date of opening of tenders is declared as a holiday, the tenders will be opened on the next working day at the same time.

SBI has the right to accept/reject any / all tenders without assigning any reasons.

On behalf of State Bank of India, Asst. Gen Manager (Premises)
GENERAL INSTRUCTIONS & CONDITIONS OF TENDER

a) Bidder shall Download the entire Technical Bid to get acquainted with the terms and conditions and shall upload technical bid, price bid and any test reports of the Equipments without fail in the e-tendering portal after filling the required fields. Bidder shall sign the all pages of the technical bid before submission.

b) Hard copies Technical bid, EMD and any test reports (except price bid) shall be submitted to the address: The Assistant General Manager, State Bank of India, Premises & Estate Department, 2nd floor, LHO Annexe building, ST. Marks Road, State Bank of India Bengaluru- 560001

c) Failing to any of the above clauses, the tender will be summarily rejected.

d) The rate quoted shall include all duties, taxes (excluding GST) levies, octal, transport, transit insurance, loading-unloading, cleaning, overheads, profit, statutory expenses, incidental expenses to supply, installation, testing and commissioning of UPS and Batteries including 2 years AMC (after warranty period). No increase in the above is acceptable to the Bank. Break up price for each item shall be provided. Cost of AMC along with SITC of items will be considered for arriving L-1.

e) The Bank shall not bind itself to accept the lowest or any tender and reserves to itself the right to accept or reject any or all the tenders, either in whole or in part without assigning any reason for doing so.

f) Initial Security Deposit: The successful tenderer shall deposit a further sum as specified in the NIT (including EMD amount) of the accepted tender value as Initial Security Deposit (ISD) by Demand draft in favour of the Client at the time of signing the contract for the execution and fulfillment of the contract. This sum will carry no interest.

g) Quantities liable to vary: The quantities indicated in the bill of quantities are only approximate, and hence may vary on either side (+ or -). The supplier, in either case, is bound to supply the modified quantities at the same rates as per accepted original tendered rates.

h) Payment Terms: No advance is payable. On receipt of material complete with all satisfactory test reports at site, installation, testing and commissioning, 95% of cost shall be paid. (However, in case delivery has been made but installation, testing and commissioning cannot be carried out because the site is not ready, 80% of cost shall be paid. Further 15% shall be paid on completion of installation, testing and commissioning).

Balance 5% of cost shall be treated as Retention Money which will be released after the defect liability period of one year from the time of commissioning the system. Retention money shall be released on producing a Bank Guarantee for an equal sum valid until the expiry of defect liability period.

i) Delivery and installation from the time of placing order.

   i) Delivery & within 3weeks from the date of receipt of our order by the vendor.
   ii) Installation, testing at site & commissioning within 1weeks from the date of delivery.

j) Validity - (a) 60days from the time of opening tender

   (b) The rate should be firm for a minimum period of six months from the date of opening tender.

k) The supplier shall be responsible for the co-ordination of the work of other contractors / sub contractors etc., The respective Supplier/contractors shall work harmoniously during installation, testing & commissioning and afford reasonable facility to each other as circumstances required.

In all matters of co-ordination the Architects/Bank Engineers decision shall be final and binding on all parties.
l) Liquidated Damages for delay in supply & completion attributable to UPS supplier: 1/2 % of the contract value per week subject to ceiling of 5% of contract value.

m) The rate shall include all interconnecting cables, UPS to Batteries etc. However, incoming and outgoing wiring shall be arranged by Bank.

n) Guarantee/ Defect liability Period: The UPS system including batteries shall be guaranteed for one year from the date of commissioning or 15 months from the date of delivery whichever is earlier.

o) Arbitration clause: All disputes and difference of any kind whether arising out of or in connection with this Agreement shall be referred to Arbitration. The Arbitrator may be appointed by both the parties or in case of disagreement each party may appoint an arbitrator and the decision of the arbitrator(s) shall be final. Such arbitration to be governed by the provisions of the Indian Arbitration Act.

p) The supplier/contractor shall strictly adhere to all prevailing acts, laws, regulations applicable to the execution of the project other safety regulations.

q) All the factory test shall carried out for all equipments to be supplied in presence of Bank’s engineer/s or other representative.

r) Agreement on stamp paper: The successful tenderer shall have to enter into an agreement on stamp paper (at successful tenderer’s cost) with us, as per our standard format, to be given with the tender document.

Date: 
Place: 
Stamp: 

Accepted/Not accepted
Applicant’s Signature
FORM OF SUBMISSION OF TENDER
(To be filled by the tenderer)

Dear Sir/s,

REF: TENDER NOTICE FOR SUPPLY OF UPS & BATTERIES TO STATE BANK OF INDIA FI & MM – RBO /DSH/RACC.

I/We hereby declare that I/ We have carefully gone through the conditions laid down in the Notice Inviting Tender, general instructions and conditions of tender Technical Specification, AMC terms and conditions, Schedule of approximate quantities, Form of Agreement, Approved manufacturers/ natural source of materials Technical Specifications of schedule of quantities, and clearly understood all the same and on the basis of the same I/ We have quoted our rates in the Schedule of Quantities (i.e. BOQ) attached with the tender documents.

I / We do here by undertaken to Supply and Maintenance of UPS and Batteries (as per tender specification) at the respective rates quoted.

I/ We are depositing a sum of Rs.47,000/- (Rupees Forty Seven Thousand Only ) as earnest money deposit by way of demand draft drawn in favor of SBI LHO BENGALURU; payable at Bengaluru along with this tender for due execution of the work at my/ our tendered rates.

In the event of this Tender being accepted I/ We agree to enter into the agreement and submit the declaration on requisite non-judicial stamp papers as and when required and execute the contract according to your form of Agreement etc., in default whereof, I/ We do hereby bind my-self / ourselves to forfeit the aforesaid deposit.

In the event of this Tender being accepted I/ We agree to obtain the labor license and the CAR and Third party insurance policy and deposit the balance E.M.D. amount and adhere/comply to all other instructions as given in TENDER DOCUMENT.

I / We further agree to supply the schedule of quantities within 3 weeks time from the date of the purchase order issued to commence the same.

I / We agree not to supply sub-standard materials/Equipment other than those that may be approved by Bank . I / We agree to pay all taxes(except GST), insurance charges as prevailing from time to time, on such items for whom same is to be levied by/ for the government, and the rates quoted by me / us are inclusive of all the same.

Yours Faithfully,

Signature of Witness:

Contractor/Supplier Name and address

1.

Name:

2.

Address:

3.

Supplier/Contractor Sign & Seal
AMC AGREEMENT
(For acceptance of AMC terms by bidder and the successful bidder shall execute this agreement before commencement of AMC)

This Agreement made on this date __________, between State Bank of India, _________ (Branch/Office Name and Place) and herein after termed of SBI, which expression shall include its successors and assigns and ________________ (AMC Vendor Name & Place) (“THE CONCERN”) which expression shall include its successors and assigns.

Whereas (“THE CONCERN”) has agreed to provide and SBI has agreed to accept from THE CONCERN repair and maintenance service for the UPS (here in after called equipment) hereto as amended from time to time, subject to the SBI paying charges to the company on the following terms and conditions.

In consideration of the premises it is agreed between the parties as follows:

1. COMMENCEMENT AND TERM:-
   1.1 This Agreement is effective for each machine from the date of commencement stated in Annexure-A and shall be for an initial term of one year.

   1.2 Upon termination or after expiration of this agreement each part shall forthwith return to the other all paper, and other properties of the other held by each for the purposes of execution of this agreement.

   In addition each party will assist the other party in the orderly termination of this Agreement on the transfer of all aspects hereof, tangible and intangible, as may be necessary for the orderly, non-disrupted business continuation of each party.

   1.3 Individual items of EQUIPMENT repair and maintenance service charge for such EQUIPMENT may be added to or withdrawn from Annexure-A of this Agreement by mutual written consent of both parties; PROVIDED ALWAYS that such consent is not unreasonable withheld. In the event that individual items of Equipment are added to Annexure-A, it may involve additional maintenance charges. In the event that individual items of EQUIPMENT are withdrawn from Annexure-A, as described herein, then any monies prepaid on such EQUIPMENT shall be held to the credit of SBI account.

2. CHARGES
   2.1 The charges payable by SBI to the CONCERN for the repair and maintenance service described herein are indicated in Annexure-A attached: and unless provided for elsewhere herein, no additional charges shall be claimed by THE CONCERN.

   2.2 THE CONCERN shall submit to SBI their invoice (S) for payments due in accordance with this Agreement. The terms of such invoice (s) are they shall be payable as indicated in Annexure-A.

   2.3 All of the prices, terms, warranties and benefits granted by THE CONCERN herein are comparable to or better than the equivalent terms being offered by THE CONCERN. Herein are comparable to or better than the equivalent terms being offered by THE CONCERN to any of its present customers. It THE CONCERN shall during the term of this Agreement, enter into arrangements with any of its customers providing greater benefits or more favorable terms, this Agreement shall there upon be deemed amended to provide the same to SBI.

3. REPAIR AND MAINTENANCE SERVICE
   3.1 During the term of this Agreement THE CONCERN agrees to maintain the EQUIPMENT in good working order and for this purpose will provide the following repair and maintenance service.
A) THE CONCERN shall correct any faults and failures in the EQUIPMENT and shall repair and replace worn or defective parts of the EQUIPMENT. In cases where unserviceable parts of the EQUIPMENT need replacement THE CONCERN shall replace such parts, at no extra cost to SBI, brand new parts or those equivalent to new parts in performance except repairs and replacement of battery.

B) THE CONCERN shall provide repair and maintenance service in response to oral including telephone notice by SBI, within two hours plus transportation time after such intimation.

C) THE CONCERN shall ensure that faults and failures intimated by SBI as above are set right within 12 hours of being informed (Kindly refer to the covering letter for the deviation).

D) THE CONCERN shall ensure that full configuration of the EQUIPMENT is available to SBI in proper working condition.

E) THE CONCERN shall ensure that the mean Time between Failures (including any malfunctioning, breakdown or faults) in the EQUIPMENT or any part thereof, as calculated during any and every quarter (period of three consecutive months) is not less than sixty days.

F) PREVENTIVE MAINTENANCE: THE CONCERN shall conduct preventive Maintenance (including but not limited to inspection, testing, satisfactory execution of all diagnostics cleaning and removal of dust and dirt from the interior and exterior of the EQUIPMENT, and necessary repairing of the EQUIPMENT) once within the first fifteen days of every subsequent Quarter during the currency of this agreement, on a day and at a time to be mutually agreed upon. Notwithstanding the foregoing, THE CONCERN recognizes SBI’s operational need and agrees that SBI shall have the right to require THE CONCERN to adjourn preventive maintenance form any scheduled time to a date and time not later than fifteen working days thereafter.

G) All engineering changes generally adopted hereafter by THE CONCERN for equipment similar to that covered by this agreement, shall be made to the EQUIPMENT at no cost to SBI.

H) All repair and maintenance service described herein shall be performed by qualified maintenance Engineers totally familiar with the EQUIPMENT.

I) THE CONCERN shall maintain at SBI’s site, a written maintenance and repair log; and shall record there incident of EQUIPMENT malfunction, date and time of commencement and successful completion of repair work and nature of repair work performed and the EQUIPMENT together with a description of the cause for work, either by description of the malfunction or as regularly scheduled preventive maintenance. SBI shall use the same log for recording the nature of faults and failures observed in the EQUIPMENT, the date and time of their occurrence and the date and time of their communication to the CONCERN.

3.2 Any worn or defective parts withdrawn from the EQUIPMENT and replaced by THE CONCERN shall become the property of THE CONCERN and the parts replacing the withdrawn parts shall become the property of SBI.

3.3 THE CONCERNs maintenance personal shall subject to clause 7 mentioned, be a given access to the EQUIPMENT when necessary, for purposes of performing the repair and maintenance services indicated in this agreement.

3.4 The EQUIPMENT may be shifted to an alternative site and installed there at during the currency of this Agreement with prior written notice of THE CONCERN. THE CONCERN shall provide necessary assistance to SBI in doing so. THE
CONCERN shall bear the charges for such shifting and reinstallation except lifting & transportation charges. However, if SBI desires to shift the EQUIPMENT to a new site and install it there urgently, SBI may shift the EQUIPMENT through its authorized technician(s) with supervision/guidance from SBI Electrical Engineer. THE CONCERN shall provide necessary assistance to SBI in re-installation and commissioning of the EQUIPMENT. This Agreement after such shifting and reinstallation would continue to be binding on THE CONCERN and SBI.

3.5 SBI shall arrange to maintain appropriate environmental conditions, such as those relations to space, temperature, and power supply, such to within the acceptable limits required for equipment similar to that covered by this agreement.

3.6 No term or provision hereof shall be deemed waved and no breach excused, unless such waiver or consent shall be in writing and signed by; the party claimed to have waived or consented. Any consent by any implied, shall not constitute a consent to or waiver of or excuse for any other, different or subsequent breach.

3.7 If, in any month, THE CONCERN does not fulfill the provisions of clauses 3.1 (C), (D), (E) and (F) the proportionate maintenance charges for that month will not be considered payable by SBI. In such an event THE CONCERN will credit the proportionate maintenance charges for the month to SBI against future payments if due or refund the amount forthwith to SBI in demand by SBI.

4.1 Neither party shall be liable for delay in performing obligations or for the failure to perform obligations if the delay or failure results from any of the following (Whether happening in India or elsewhere) force major, Act of God or any governmental act, fire, earthquake, explosion, accident, industrial dispute, civil commotion or anything beyond the control of either party. The parties shall use all responsible endeavors to minimize any such delay. Upon cessation of the event giving rise to the delay, the parties shall in so far as may be practicable under the circumstances complete performance of their respective obligations hereunder. Notwithstanding the foregoing, if any of the above mentioned events shall preclude THE CONCERN from meeting any or all of its obligations hereunder, for a period of more than 3 months from the date of occurrence of such act, it shall be open to SBI to rescind this contract by giving one month’s notice.

5.1 THE CONCERN will not subcontract or permit anyone other than THE CONCERN personnel to perform any of the work, services or other performance required of THE CONCERN under this agreement without the prior written consent of SBI.

6.1 SBI shall have the right to make changes and attachments to the EQUIPMENT provided such changes or attachments do not prevent proper maintenance from being performed, or unreasonably increase THE CONCERN cost of performing repair and maintenance service.

7.1 THE CONCERN agrees that it and its personnel will at all times comply with all security regulations in effect from time to time at SBI’s premises and externally for materials belonging to SBI.

8. CONFIDENTIALITY
8.1 THE CONCERN acknowledges that all material and information which has or will come into its possession or knowledge in connection with this Agreement or the performance hereof, consists of confidential and proprietary data, whose disclosure to or use by third parties will be damaging or cause loss to SBI. THE CONCERN, agrees to hold to make use the other than only to employees requiring such information and not be release or disclose it to any other part. THE CONCERN agrees to take appropriate action with respect to its employees to ensure that the obligations of non-use and no-disclosure of confidential information under this Agreement can be fully satisfied.

9. LIABILITY AND INDEMNITIES

9.1 THE CONCERN represents and warrants that the repair and maintenance service/products hereby sold do not violate or infringe upon any patent, copyright trade secret or other property right of any other person or either entity. THE CONCERN agrees that it will and hereby does indemnify SBI from any claim directly or indirectly resulting from, or arising out of any breach or claimed breach of this warranty.

10. BUSINESS TERMINATION:

10.1 In the event THE CONCERN shall cease conducting business in the normal course, or wind up make a general assignment for the benefit of creditors, suffer or permit the appointment of a receiver for its business or assets or shall avail itself of or become subject to any proceeding under any act or statute of our country or state relating to insolvency or the protection of rights of creditors, then (at the option of SBI notwithstanding clause 1.1 of the Agreement). This Agreement shall terminate and be of no further force and effect and any property or rights of such other part, tangible or intangible, shall forthwith be returned to it.

11. TERMINATION OF THIS AGREEMENT

11.1 This Agreement may be terminated by either party in any of the following circumstances:

a) If SBI do not make payments due to THE CONCERN under this Agreement in terms of clauses 2.1 and 2.2 above.

b) If SBI does not maintain appropriate environmental conditions as indicated in clause 3.5 of this Agreement.

c) Under the provision of clause 4.1 and or 10 of this agreement.

12. ARBITRATION

12.1 All disputes and difference of any kind whether arising out of or in connection with this Agreement shall be referred to Arbitration. The Arbitrator may be appointed by both the parties or in case disagreement each party may appoint an arbitrator and the decision of the arbitrator(s) shall be final. Such arbitration to be governed by the provisions of the Indian Arbitration Act.

13. GENERAL

13.1 Marginal notes and heading are for guidance only and are not intended to be read or construed as part of this Agreement.

13.2 No amendment to this Agreement shall be effective unless it is in writing and signed by duty authorized representatives of both parties.

13.3 Each party warrants and guarantees that it has full power and authority to enter into and perform this Agreement, and the person signing this Agreement on behalf of each has been properly authorized and empowered to enter into this Agreement. Each party further acknowledges that it has read this Agreement, understands it and agrees to be bound by it.

13.4 Words importing this singular include the plural and vice versa.
ANNEXURE-A OF AMC AGREEMENT

AMC of UPS & Batteries

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Description of Equipment</th>
<th>Machine No.</th>
<th>AMC period</th>
<th>Quantity</th>
<th>Amount in ₹</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
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<tr>
<td>N</td>
<td></td>
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Total

GST

Grand Total
### UPS TECHNICAL SPECIFICATION

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1. | Technology | a) UPS system with pulse width modulation (PWM) technology in True On-line Configuration. With double conversion using IGBTs in the Inverter and converter.  

b) Provision for configuration UPS system in parallel load sharing mode. Indicate the maximum No. of UPS system that can be connected in parallel for forming N+1 (Configuration)  
c) The requirement is fully rated capacity of single module in parallel with similar module of similar units. Paralleling of UPS should be capable of individually starting, running and feeding to the load apart from parallel operation. Inverters should be synchronized with common by pass supply |
| 2. | Inversion Technique | Adaptive pulse width modulation or sine weighted pulse width modulation with high switching frequency (> 12 KHZ for IGBTs). |
| 3. | Input Voltage Range | Three Phase, 415+15%-30% V (for capacity =>5kVA)  
There should be input to output isolation. Static by-pass arrangement may be connected in such a way that the input and output sides shall always remain galvanically isolated. |
| 4. | Input frequency | 45 Hz to 55 Hz |
| 5. | Nominal D.C voltage | 72 V to 408 V DC (taking nominal 2 V per cell)  
i) 5kVA  
ii) 10kVA  
iii) 15kVA  
iv) 20kVA |
| 6. | Output voltage | 220/230V.A.C+1%/- 1% up to 20KVA |
| 7. | Output frequency | 50Hz +/- 4% (Synchronous to mains)  
50Hz +/- 0.1% (Free running) |
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<tbody>
<tr>
<td>8.</td>
<td><strong>Power Factor</strong></td>
<td>The UPS shall be provided with Active input P.F. correction system TC obtains P.F. 0.95 to unity when the connected load P.F. varies from 0.6 to unity.</td>
</tr>
</tbody>
</table>
| 9. | **Total Harmonic Distortion** (o/p voltage) | < 2% for linear load  
< 4% for non-linear load |
| 10. | **Harmonic Distortion** | < 10% |
| 11. | **Waveform (Output)** | Sine Wave |
| 12. | **Overload capacity** | 110% for 10 minutes ) During the test the load  
150% for 1 minute ) should not get transferred to mains through static switch |
| 13. | **Transient response and Voltage recovery time for step load** | For 100% Step load (Test at unity P.F taking rated capacity KVA = KW) i.e. from full load to no load and no load to full load.  
Dip < 3%  
Peak < 3% with recovery time within 3 cycles to normal output voltage. |
| 14. | **Efficiency** | Overall > 91.5% + i.e. between 90.5 & 92.5% full load. (5/10/15/20kVA)  
88% + 1 at 66% load and 85% + 1 at 33% load. |

**Definition of overall efficiency:** It is the ratio of output power in KW to the input power with battery disconnected, or, battery charging power added to the output.

Testing shall be at full load, 66% load, 33% load (unity PF i.e. rated capacity in KVA=KW).

**Penalty applicable** – If the overall efficiency is found to be less than the Bank’s specified range, the UPS is to rejected and replacement passing the test to be obtained. No further tolerance is permissible.

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<tbody>
<tr>
<td>15.</td>
<td><strong>Operating Temperature</strong></td>
<td>0 to 50 Degree Celsius</td>
</tr>
<tr>
<td>16.</td>
<td><strong>Crest factor</strong></td>
<td>&gt;3.0</td>
</tr>
<tr>
<td>17.</td>
<td><strong>Relative Humidity</strong></td>
<td>95% at 35 Degree centigrade non-condensing</td>
</tr>
</tbody>
</table>
| 18. | **Noise level** | At 1 meter from the UPS.  
< 55 DBA for < 10KVA.  
<60 DBA for < 10 KVA.  
(Proto-type test certificate required) |
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| 19. | Charger | Built in solid state float- cum-boost charger with automatic boost/trickle charge modes with current limiting features. The charger characteristics shall be such as to match the float/boost charging of the batteries as per battery characteristics for enhancing the life of batteries. The charger should be designed for at least 15% of the total battery current as per working given below:

Example:-
Battery terminal voltage - 408 V DC
Battery A H - 100 A H
Total Battery capacity: 408 × 100 VAH = 40,800 VAH
Total Battery current = 40,800/410 = 100 Amps
Minimum Charging Current required @ 15% = 100 × 15/100 = 15 Amps. |
| 20. | Interface facility | The UPS system should have necessary hardware and software

1. USB port to work on existing operating systems.

2. Remote Monitoring through SNMP facility/RS 232 port /RS 485 port. whenever necessary, conditions such as:

   a) Power failure: UPS working on batteries preferably to indicate
      I. Present load in percentage
      II. Time up to which batteries can support with present load (Dynamic battery backup time)
      III. Warning well in advance of shut down of the system.

   b) Inverter ON/OFF/Faulty/Trip,

   c) Battery Low

   d) Static by-pass ON

   **Data sheet of Interfacing facility/port shall be enclosed** |
| 21. | Remote Indication Unit | N/A |
| 22. | Protection | a) Isolation – Output shall be fully isolated from mains and surge/spike suppressors to be incorporated.

b) Current limiting protection (Fuse less Electronic) Built in overload / short circuit protection with snubber circuits for current limit.

c) Soft start on Inverter and charger arrangement

d) Phase locking mechanism for UPS and mains frequency – for 3 phase output.

e) Over voltage/under voltage protection.

f) Short circuit/ Overload protection through MCB/ MCCB

g) All other protection systems required for safety of UPS system. |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th>such as over temperature protection etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>h)</td>
<td>Protection against earth leakage current by suitable protective devices like negative sequence current sensor /RCCB.</td>
</tr>
</tbody>
</table>

| 23. | 1) Thyristor based static (Auto) by-pass switch | Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from inverter to by-pass and vice versa should be provided along with manual by-pass switch. |
|   | 2) Manual by-pass switch |   |

| 24. | Indications. | a) Mains ON with phase indication for single phase/ 3 phase separately for all the phases. |
|   |   | b) Inverter ON/OFF/FAULTY/TRIP (Reason) |
|   |   | c) Charger ON/FAULTY/TRIP (Reason) |
|   |   | d) Battery Low |
|   |   | e) Static by-pass ON |
|   |   | f) Over temperature |

| 25. | Alarm | a) Low battery alarm to be provided |
|   |   | b) Mains failure /load on battery alarm to be provided Both Should be audio visual. |
|   |   | c) Over temperature alarm in two stages |
|   |   | 1<sup>st</sup> stage : Warning, intermittent audio alarm |
|   |   | 2<sup>nd</sup> stage: Tripping, continuous audio visual and resettable. |

| 26. | Metering | Digital panel Meter duly calibrated up to 105 accuracy class or LCD display system to indicate the following |
|   |   | a) A.C. voltage : Input, output (each phase in case of 3 phase) |
|   |   | b) A.C. current : Input, output (each phase in case of 3 phase) |
|   |   | c) D.C. battery voltage |
|   |   | d) D.C. Charging/discharging current |
|   |   | e) Frequency –Input, Output |

| 27. | Battery set | A. Complete with stand |
|   | Tubular batteries | B. Make: Exide, Southern Batteries, amco-instapower. |
|   |   | C. Back-up time shall be designed with battery drain of less than |
75% or as per manufacture's recommendations for enhanced battery life.

D. The back-up time at full load shall be Two Hours

E. Battery set details to be indicated by the supplier:

<table>
<thead>
<tr>
<th>Battery bank for UPS capacity</th>
<th>Back up Hours</th>
<th>D.C. Terminal voltage</th>
<th>No of batteries in battery bank</th>
<th>Ampere-Hour capacity of each battery</th>
<th>Make of Battery</th>
<th>Warranty years</th>
</tr>
</thead>
<tbody>
<tr>
<td>5kVA</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10kVA</td>
<td>2</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>15kVA</td>
<td>2</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20kVA</td>
<td>2</td>
<td></td>
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</tr>
</tbody>
</table>

28. Testing: The supplier shall have facilities to carry out the following tests at factory center, and tests will have to be satisfactorily carried out before acceptance.

a) No load voltage variation tests (voltmeter with variac for input variation)

b) Steady state regulation tests (voltmeter with standard load)

c) Harmonic distortion tests (Distortion meter)
   i) output voltage
   ii) input current

d) Overload tests (Simulate)

e) Waveform tests on oscilloscope
   i) No load
   ii) Resistive load
   iii) Inductive load
   iv) SMPS or electronic load (If SMPS load is not available at the factory, the same should be simulated by using as load a configuration of another UPS and resistive load as under:

   ![Diagram of UPS configuration](image)

   f) Inverter high/low output voltage setting tests (simulate)

g) Static by-pass setting, by-pass time, bi-directionality of static switch operation on storage oscilloscope (simulate)

h) Short circuit protection / current limit (simulate)

i) Battery low alarm setting cut-off tests.
   (Test to be conducted by simulation)

j) Efficiency tests (arrange load tests)
k) Overall efficiency  
   a) Full load  
   b) 66% load  
   c) 33% load

l) Endurance system to be switched on with full load for 8 hours to demonstrate that it operates without any malfunction including temperature rise (Type test)

m) Earth leakage 

n) Charging Current – current limiting capability testing to be simulated by increasing charger voltage.

o) Battery backup test at full load

p) Input Power Factor

q) Crest factor

r) Test to demonstrate the switching frequency (more than 12KHZ)

s) In addition to the tests mentioned under “testing” in “Technological specifications for “On-Line UPS System”, the following tests / certification, shall also be, performed by / obtained from, the agencies specified above.
   i) Technology certificate
   ii) Inversion Technique certificate
   iii) Tests at (b), (c), (d) & (j) shall be performed with full resistive load, full inductive load and SMPS load.

t) Test at (k) shall be performed with full resistive load.

Notes:
   i) If the UPS does not conform to specification either during factory test or at site, the Bank reserve the right to reject the same. The successful tenderer shall then have to remove the same at his cost from site and supply a new piece conforming to the specifications.

   ii) The successful tenderer shall have to make all arrangements for all types of loads and electric supply required for the tests mentioned herein.

The Bank reserves the right to randomly decide to carry out testing of a few UPS Systems at site after installation at the cost of UPS vendor, who will be required to arrange for all the requisite variacs, meters, loads etc. and carry out the tests through vendor’s personnel in the presence of Bank’s engineer/s.

Place:                         Applicant’s Signature
Date:                         Stamp: