भारतीय प्रौद्योगिकीसंस्थानमद्रास चेन्नै 600 036
INDIAN INSTITUTE OF TECHNOLOGY MADRAS Chennai 600 036
भंडार एवं क्रय अनुभाग
STORES & PURCHASE SECTION
Telephone : (044) 2257 8288/8285/8287
email ID-adstores@iitm.ac.in
IIT Madras GSTIN : 33AAAAI3615G1Z6

G. Chitrapavai
Deputy Registrar (Stores & Purchase)

Dated : 02.04.2019

Tender No. IITM/SPS /UPS-RC/Tech Enq./001/2019-20/SPL

Dear Sirs,

On behalf of the Indian Institute of Technology Madras, Tenders are invited for the purchase of

"UPS System with Batteries (Rating from 1 kVA to 30 kVA) on rate contract basis"

Confirming to the specifications enclosed.

Tender Documents may be downloaded from Central Public Procurement Portal https://etenders.gov.in/eprocure/app Aspiring Bidders who have not enrolled / registered in eprocurement should enroll / register before participating through the website https://etenders.gov.in/eprocure/app. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at **"Help for contractors".** [Special Instructions to the Contractors/Bidders for the e-submission of the bids online through this eProcurement Portal"].

Tenderers can access tender documents on the website (For searching in the NIC site, kindly go to Tender Search option and type 'IIT'. Thereafter, Click on "GO" button to view all IIT Madras tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website https://etenders.gov.in/eprocure/app as per the schedule attached.

No manual bids will be accepted. All quotation both Technical bid and Financial bid should be submitted in the E-procurement portal.

1	**LAST DATE for Sample Submission**	:	25.04.2019 before 2.00 PM
	Address for sample Submission	:	The Head Central Electronics Centre Indian Institute of Technology Madras Chennai – 600 036 Phone No. 044-2257 4945 Contact person : Dr. C.R. Jeevandoss, Instrumentation Engineer, CEC
	Last Date & Time for submission of tender	:	25.04.2019 before 2.00 PM
	Date & Time of opening of Tender – TECHNICAL BID		26.04.2019 at 3.00 PM **Venue : 2nd floor, Conference Room, Administration Building, IIT Madras**

	Date & Time of Price Bid Opening	:	Will be intimated through e-tenders portal after opening of Technical Bid.
A	**Sample Submission**	:	❖ **For each model, kindly arrange one sample of 1kVA, any one sample in 3kVA to 5kVA and any one sample in 10kVA to 30kVA UPS model** quoted with Batteries to the Head, Central Electronics Centre, Indian Institute of Technology Madras, Chennai – 600 036, Phone No. 044-2257 4945 for necessary Testing and Technical Evaluation on or before the due date of sample submission. ❖ Kindly furnish the technical particulars along with Product Catalogue, Test Certificates for the UPS Configuration for each and every model separately. ❖ Please mention the kVA rating, type and configuration failing which your quotation will be rejected. ❖ THE INSTITUTE SHALL NOT BE RESPONSIBLE FOR THE LATE RECEIPT OF SAMPLE AND ORIGINAL EMD AMOUNT.
B	**Instructions for online bid submission**	:	**REGISTRATION** i. Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal URL:https://etenders.gov.in/eprocure/app by clicking on "Online Bidder Enrollment". Enrolment on the CPP Portal is free of charge. ii. As part of the enrolment process, the bidders will be required to choose a unique user name and assign a password for their accounts. iii. Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal. iv. Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.) v. https://etenders.gov.in/eprocure/app?component=%24DirectLink&page=DSCInfo&service=direct&session=T with their profile. vi. Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse. vii. Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / eToken.
	Guidelines, Terms and Conditions of Tender		
C	**Searching for tender documents**	:	i. There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location,

			date, other keywords etc. to search for a tender published on the CPP Portal. ii. Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective **"My Tender"** folder. This would enable the CPP Portal to intimate the bidders through SMS / email in case there is any corrigendum issued to the tender document. iii. The bidder should make a note of the **unique Tender ID** assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.
D	**Preparation of bids**	**:**	i. Bidder should take into account any corrigendum published on the tender document before submitting their bids. ii. Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid. iii. Bidder, in advance, should prepare the bid documents to be submitted as indicated in the tender document / schedule and generally shall be in PDF formats as the case may be. Bid documents may be scanned with 100 dpi with black and white option. iv. To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, GSTIN Details, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use **"**My Documents" area available to them to upload such documents. These documents may be directly submitted from the "My Documents" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.
E	**Submission of bids**	**:**	i. Bidder should log into the site well in advance for bid submission so that he/she upload the bid in time i.e. on or before the bid submission date and time. Bidder will be responsible for any delay due to other issues. ii. **Bids submitted will be summarily rejected if samples for testing is not submitted within the stipulated time.** iii. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document. iv. Bidder has to transfer the EMD as applicable by online mode only. The EMD should be transferred on or before the closure date and time of the tender. If the EMD is not transferred before the closure date and time, the tender will be summarily rejected. **The EMD transferred to IIT Madras (as per IIT Madras Account details given in Clause I (i) and the proof of transfer has to be submitted in the technical bid. Otherwise, the tender will be summarily rejected.**

			v. A standard BOQ format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BOQ file, open it and complete the detail with their respective financial quotes and other details (such as name of the bidder). If the BOQ file is found to be modified by the bidder, the bid will be rejected. vi. The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission. vii. The **Tender Inviting Authority (TIA)** will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders due to local issues. viii. The uploaded tender documents become readable only after the tender opening by the authorized bid openers. ix. Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details. x. Kindly add scanned PDF of all relevant documents in a single PDF file of compliance sheet. xi. **No manual bid submission is entertained.**
F	**Assistance to bidders**	**:**	i. Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender. ii. Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is [0120-4200462, 0120-4001002, 0120-4001005]
G	**General Instructions to the Bidders**	**:**	i. The tenders will be received online through portal https://etenders.gov.in/eprocure/app. In the Technical Bids, the bidders are required to upload all the documents in pdf format. ii. Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name is a prerequisite for registration and participating in the bid submission activities through https://etenders.gov.in/eprocure/app iii. Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web site https://etenders.gov.in/eprocure/app under the "Information about DSC".
H	**Opening of the tender**	**:**	The online bid will be opened by a committee duly constituted for this purpose. Online bids (complete in all respect) received along with scanned copy of EMD (if any) will be opened as mentioned at "Annexure: Schedule". Bid received without EMD (if present) will be rejected straight way. The

			technical bid will be opened online first and it will be examined by a technical committee (as per the eligibility criteria, specification and requirement and testing of the samples submitted.) The financial offer/bid will be opened only for the offer/bid which technically meets all requirements as per the specification.
I	**Earnest Money Deposit (EMD)**	**:**	i. **EMD for Rs.20,000/- (Rupees twenty thousand only) should be transferred through NEFT/RTGS or any mode to the following bank account on or before due date 22.04.2019 before 2:00 p.m.** **Name : Registrar IIT Madras** **Bank : State Bank of India** **Account No. : 10620824305** **Branch : IIT MADRAS** **IFSC CODE : SBIN0001055** ii. The EMD will be returned to unsuccessful Bidder, after finalization of the tender. The EMD shall be forfeited if any Bidder withdraws his offer before finalization of the tender or fails to submit the acceptance within 10 days from the date of award of contract. iii. The EMD amount **should not send through DD**.
J	**Marking on Technical Bid**	**:**	i. The technical Specification for this tender is given in **Annexure A**. The tenderer shall go through the specification and submit the technical bid. ii. The Technical bid should be submitted in the proforma given as per **Annexure B in PDF format only through online (e-tender). No manual submission of bid is entertained.** **iii. All technical bid should have the page-wise heading as "Technical Bid" and page no. in all pages with seal and signature of authorized signatory. The total no. of pages should be mentioned at the last page of the documents.** iv. The technical bid should consist of all technical details along with catalogue/brochure and other technical, commercial terms and conditions.
K	**Marking on Price Bid**	**:**	**i.** Price bid should be submitted in the prescribed proforma **(Annexure C)** as per **BOQ** in **pdf format** through e-tender only. **No manual submission of bid is entertained.** ii. Price bid should indicate item-wise price for all the items mentioned in the technical bid.
2	**Preparation of Tender:** a) You should quote your product as per our specification requirements by mentioning our requirements and your offer side by side and the rate should be in total as per our requirements. We will not make any calculation if you have mentioned the rates of items separately. b) The offer/bids should be submitted through online only in two bid system i.e. Technical Bid and Price Bid separately.		
3	**Signing of Tender:** The Tender is liable to be rejected if complete information is not given therein or if the particulars and date (if any) asked for in the schedule to the Tender are not fully filled in or not duly signed/authenticated. Specific attention is drawn to the delivery dates and terms and conditions enclosed		

	herewith. **Each page of the technical bid required to be signed and bears the official seal of the tenderers.** If the application is made by a firm in partnership, it shall be signed (with seal)by all the partners of the firm above their full typewritten names and current addresses or alternatively by a partner holding power of attorney for the firm in which case a certified copy of the power of attorney shall accompany the application. A certified copy of the partnership deed along with current addresses of all the partners of the firm shall also accompany the application. If a limited company or a corporation makes the application, it shall be signed by a duly authorized person holding power of attorney for signing the application, in which case a certified copy of the power of attorney shall accompany the application. Such limited company or corporation may be required to furnish satisfactory evidence of its existence. The applicant shall also furnish a copy of the Memorandum of Articles of association duly attested by a Public notary.
4	**Period for which the offer will remain open:** i. Firms tendering should note the period for which it is desired that their offers should remain open for acceptance. If the firms are unable to keep their offers open for the specified period they should specifically state the period for which their offers are being provided, however, the day up to which the offer is to remain open being declared closed holiday for the Indian Institute of Technology Madras, the offer shall remain open for acceptance till the next working day. ii. Quotations qualified by such vague and indefinite expressions such as 'subject to immediate acceptance', 'subject to prior sale' will not be considered. ii. The Tender shall remain open for acceptance/validity till: **60 days from the date of opening of the tender.**
5	**Prices:** I. The prices quoted by the **Tenderer for base price should be exclusive of TAX and inclusive of the other statutory levies like packing, delivery charges and installation charges etc** (and should be clearly stated to be so) which will be paid by the Purchas er/if legally leviable at the rate ruling on the date of supply as specified in the Acceptance of Tender. The % of tax should mention separately accordingly in the mentioned format. If the exclusive price is not given, we will treat your offered rate as inclusive rate and comparison be made with others. If at the time of comparison of your offer without taxes etc. is happen to be lowest, you must bound to supply as per the offered rate, i.e. without taxes, etc. Hence, you are requested to be careful while quoting for tender. II. No price revision will be allowed during the rate contract period. You must give an undertaking to the effect that, in case of downward price movement during the Rate Contract period, the firm shall pass on the advantage to IIT Madras. Your quotation will be summarily rejected, if such undertaking does not accompany the quotation. III. Counter offering will be made to all the technically qualified vendors to match the L1 price. IV. Discount, if any, should be indicated prominently. For bulk orders, the % of discount offered may also be indicated in the following slabs. (i) 2 to 10 Nos. (ii) 11 to 25 Nos. (iii) 26 Nos. and above. For bulk orders exceeding 25 Nos., we have the liberty to negotiate with you for further reduction in the prices offered. If you do not quote, it will be presumed that you are not open for BULK ORDER. Within these categories, you may quote for sub-slabs also.

	V. With reference to the Notification No. 45/2017 – Central Tax (Rate) Dated 14th November 2017 & Notification No.47/2017 – Integrated Tax (Rate) Dated 14th November 2017, IIT Madras is eligible for concessional GST @ 5% on IGST and @ 2.5% for CGST and SGST for procurement of Equipments and Consumables for research purpose. VI. More than one vendor may be empaneled under the rate contract and the vendor may be asked to match the L1 Price.
	Withdrawal of a Model quoted in the Rate Contract is acceptable ONLY IF accompanied by a certificate from the manufacturer to that effect. Correspondence in this connection must be addressed to Deputy Registrar (Stores & Purchase).
7	No Advance Payment will be made for Indigenous purchase. Payment will be made only after supply on satisfactory installation.
8	**Terms and conditions :** Failure to comply with any of the instructions stated in this document or offering unsatisfactory explanations for non compliance will likely to lead to rejection of offers.
9	**Right of Acceptance:** IIT MADRAS reserves the right to reject the whole or any part of the Tender without assigning any reason or to accept them in part or full.
10	**Communication of Acceptance:** Acceptance by the Purchaser will be communicated by Post, if required, and the Company's acceptance communicated to us formally in writing.
11	**Warranty**: Warranty should be in clear terms. Indicate price change (if any) for extra year warranty.
12	**Delivery Period:** Items should be delivered within one week from the date of P.O./Award of Contract (AOC).Please indicate the actual delivery period clearly. No further extension of time will be allowed. Non delivery of items will lead to cancellation of Purchase Order without any notice. In addition, action may be taken for removing them from our mailing list.
13	In terms of Rule 173 (iv) of General Financial Rules, 2017 the bidder shall be at liberty to question the bidding conditions, bidding process and/or rejection of its bid.
14	**Conditions of contract:** Tenderer should quote on the basis of the conditions referred to in Para of the invitation to tender and tender papers. In case these terms and conditions are not acceptable to the tenderer, he should specifically state the deviation(s) there from in the body of the tender.
15	**Transit Insurance:** The Purchaser will not pay separately for Transit Insurance.
16	**Tenderer shall submit along with his Tender:** Name and full address of the Banker and their swift code and PAN No. and GSTIN number.
17	**GUARANTEE:** The tenderer has to declare that the goods sold to the buyer under this contract shall be of the best quality and workmanship and shall be strictly in accordance with the specifications. Tenderer should indicate the period for which the said goods/articles would continue to confirm to the specifications.
18	**Jurisdiction:** All questions, disputes, or differences arising under, out of or in connection with the contract, if concluded, shall be subject to the exclusive jurisdiction at the place from which the acceptance of Tender is issued.
19	**Force Majeure:** The Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that, it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure. • For purposes of this Clause, "Force Majeure" means an event beyond the control of the Supplier

	and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not limited to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes. • If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.
20	**Risk Purchase Clause:** In event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from the other source on the total risk of the supplier under risk purchase clause.
21	**VENDOR ELIGIBILITY CRITERIA AND TECHNICAL SPECIFICATIONS:** • Dealers must submit an authorized dealership certificate from the manufacturer along with Technical bid for each brand quoted by them, otherwise the bid will be summarily rejected. • The UPS systems with batteries must function as per the specifications in Annexure A at room temperature without Air-Conditioners**.** • **The following battery make only will be considered for UPS: Global Yuasa, Yuasa, Panasonic, Rocket, Hitachi, Exide & Amar Raja / Quanta.** • **Warranty:** 3 years for UPS systems with batteries. • Test report from the accredited laboratory should be provided in the technical bid for the standards specified Annexure A.

Yours Faithfully

-sd/-
Deputy Registrar
(Stores & Purchase Section)

ACKNOWLEDGEMENT

It is hereby acknowledged that I/We have gone through all the points listed under "Specification, Guidelines, Terms and Conditions" of tender document. I/We totally understand the terms and conditions and agree to abide by the same.

SIGNATURE OF TENDERER ALONG WITH
SEAL OF THE COMPANY WITH DATE

ANNEXURE A

TECHNICAL SPECIFICATIONS FOR
"UPS SYSTEM WITH BATTERIES (RATING FROM 1 KVA TO 30 KVA)"

Sl. No.	kVA	Backup Time
1.	1 kVA UPS True On Line, Sine Wave Output without isolation transformer.	15 Minutes
2.	1kVA, 2 kVA, 3 kVA,& 5 kVA – True Online Sine wave output with isolation transformer	30 Minutes
3.	1kVA, 2 kVA, 3 kVA,& 5 kVA – True Online Sine wave output with isolation transformer	60 Minutes
4.	10 kVA, 15 kVA, 20 kVA & 30 kVA – True Online Sine wave output with 30 minutes backup and 60 minutes back-up with provision for 3 phase input and 1 phase output, 3 phase input and 3 phase output with isolation transformer	30 Minutes
5.	10 kVA, 15 kVA, 20 kVA & 30 kVA – True Online Sine wave output with 30 minutes backup and 60 minutes back-up with provision for 3 phase input and 1 phase output, 3 phase input and 3 phase output with isolation transformer	60 Minutes

TECHNICALSPECIFICATIONS **ANNEXURE - A**

1kVA UPS True On Line, Sine wave Output without isolation transformer

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs.

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters
1.	Input Voltage Range @ F.L	::	180V-270V AC
2.	Input Power Factor @ F.L	::	> 0.95
3.	Input Frequency Variation	::	50 Hz ± 5%
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time: Watt Hr. Required — 36V Bus / 48V Bus 15 Mins: >250 Watt Hr / >250 Hr
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%
6.	Transient Voltage Regulation at Step Load	::	< 5%
7.	Maximum deliverable continuous Output Power	::	>800W
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ± 0.5%(Free running).
9.	Efficiency	::	
(i)	Battery mode	::	> 80%
(ii)	Mains mode	::	> 80%
10.	THD @ F.L	::	<3% (for linear load); <5%(for nonlinear load)
11.	Crest Factor @ F.L	::	> 3 : 1
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.
14.	Temperature and Humidity	::	
(i)	Operating Temperature Range	::	Up to 40ºC
(ii)	Humidity	::	upto 95% Rh
15.	Noise level (at 1 meter)	::	< 45 dB
16.	Conformance to Standards	::	
(i)	Performance	::	IEC 62040-3
(ii)	EMC Standards	::	IEC62040-2

(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply with the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Current limiting, over load and Short circuit protection.

b) Phase locking mechanism with mains frequency.

c) Over voltage / under voltage protection.

d) All other protection systems as required for safety of the system.

Warranty and AMC

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period

Important instructions:

a) Quote should indicate the Model/Series Name and Model Number of UPS
b) Batteries must be SMF type of following make:
Hitachi, Panasonic, Global Yuasa, Yuasa, Base, Exide, Amara raja or Rocket.
c) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

TECHNICAL SPECIFICATIONS

1kVA UPS True On Line, Sine wave Output

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

<table>
<tr><th>Sl. No.</th><th>Specification</th><th></th><th>Parameters</th></tr>
<tr><td>1.</td><td>Input Voltage Range @ F.L</td><td>::</td><td>180V-270V AC</td></tr>
<tr><td>2.</td><td>Input Power Factor @ F.L</td><td>::</td><td>> 0.95</td></tr>
<tr><td>3.</td><td>Input Frequency Variation</td><td>::</td><td>50 Hz ± 5%</td></tr>
<tr><td>4.</td><td>Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment</td><td>::</td><td>
<table>
<tr><th rowspan="2">Backup time</th><th colspan="2">Watt Hr. Required</th></tr>
<tr><th>36V Bus</th><th>48V Bus</th></tr>
<tr><td>For 30 Min</td><td>> 864 Watt Hr</td><td>> 864 Watt Hr</td></tr>
<tr><td>For 60 Min</td><td>> 1440 Watt Hr</td><td>> 1440 Watt Hr</td></tr>
</table>
</td></tr>
<tr><td>5.</td><td>AC Output Voltage and steady state Regulation @ F.L</td><td>::</td><td>230V AC; better than ± 1%</td></tr>
<tr><td>6.</td><td>Transient Voltage Regulation at Step Load</td><td>::</td><td>< 5%</td></tr>
<tr><td>7.</td><td>Maximum deliverable continuous Output Power</td><td>::</td><td>> 800W</td></tr>
<tr><td>8.</td><td>Output Frequency</td><td>::</td><td>50 Hz ± 4%(Synchronous to mains)
50 Hz ±0.5%(Free running).</td></tr>
<tr><td>9.</td><td>Efficiency</td><td>::</td><td></td></tr>
<tr><td>(i)</td><td>Battery mode</td><td>::</td><td>> 80%</td></tr>
<tr><td>(ii)</td><td>Mains mode</td><td>::</td><td>> 80%</td></tr>
<tr><td>10.</td><td>THD @ F.L</td><td>::</td><td>< 3% (for linear load); <5% (for nonlinear load)</td></tr>
<tr><td>11.</td><td>Crest Factor @ F.L</td><td>::</td><td>> 3 : 1</td></tr>
<tr><td>12.</td><td>Over Load Duration @ 110%, 125% and 150% of F.L</td><td>::</td><td>5 min, 1 min and 2 sec respectively</td></tr>
<tr><td>13.</td><td>Static bypass switch</td><td>::</td><td>Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.</td></tr>
<tr><td>14.</td><td>Temperature and Humidity</td><td>::</td><td></td></tr>
<tr><td>(i)</td><td>Operating Temperature Range</td><td>::</td><td>upto 40ºC</td></tr>
<tr><td>(ii)</td><td>Humidity</td><td>::</td><td>upto 95% Rh</td></tr>
<tr><td>15</td><td>Noise level (at 1 meter)</td><td>::</td><td>< 45 dB</td></tr>
</table>

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16.	Conformance to Standards	::	
(i)	Performance	::	IEC 62040-3
(ii)	EMC Standards	::	IEC62040-2
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply with the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.

Warranty and AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base, Exide, Amara raja or Rocket.

c) Quote should indicate the Model/Series Name and Model Number of UPS

D) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

TECHNICAL SPECIFICATIONS

2kVA UPS True On Line, Sine wave Output

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Fre switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

<table>
<tr><th>Sl. No.</th><th>Specification</th><th></th><th>Parameters</th></tr>
<tr><td>1.</td><td>Input Voltage Range @ F.L</td><td>::</td><td>170V-270V AC</td></tr>
<tr><td>2.</td><td>Input Power Factor @ F.L</td><td>::</td><td>> 0.95</td></tr>
<tr><td>3.</td><td>Input Frequency Variation</td><td>::</td><td>50 Hz ± 5%</td></tr>
<tr><td>4.</td><td>Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment</td><td>::</td><td>
<table>
<tr><td rowspan="2">Backup time</td><td colspan="2">Watt Hr. Required</td></tr>
<tr><td>48V Bus</td><td>72 / 96 V Bus</td></tr>
<tr><td>For 30 Min</td><td>> 2016 Watt Hr</td><td>> 2304 Watt Hr</td></tr>
<tr><td>For 60 Min</td><td>> 3120 Watt Hr</td><td>> 3648 Watt Hr</td></tr>
</table>
</td></tr>
<tr><td>5.</td><td>AC Output Voltage and steady state Regulation @ F.L</td><td>::</td><td>230V AC; better than ± 1%</td></tr>
<tr><td>6.</td><td>Transient Voltage Regulation at Step Load</td><td>::</td><td>< 5%</td></tr>
<tr><td>7.</td><td>Maximum deliverable continuous Output Power</td><td>::</td><td>> 1600W</td></tr>
<tr><td>8.</td><td>Output Frequency</td><td>::</td><td>50 Hz ± 4%(Synchronous to mains)
50 Hz ±0.5%(Free running).</td></tr>
<tr><td>9.</td><td>Efficiency</td><td>::</td><td></td></tr>
<tr><td>(i)</td><td>Battery mode</td><td>::</td><td>> 80%</td></tr>
<tr><td>(ii)</td><td>Mains mode</td><td>::</td><td>> 80%</td></tr>
<tr><td>10.</td><td>THD @ F.L</td><td>::</td><td>< 3% (for linear load); <5% (for nonlinear load)</td></tr>
<tr><td>11.</td><td>Crest Factor @ F.L</td><td>::</td><td>> 3 : 1</td></tr>
<tr><td>12.</td><td>Over Load Duration @ 110%, 125% and 150% of F.L</td><td>::</td><td>5 min, 1 min and 2 sec respectively</td></tr>
<tr><td>13.</td><td>Static bypass switch</td><td>::</td><td>Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.</td></tr>
<tr><td>14.</td><td>Temperature and Humidity</td><td>::</td><td></td></tr>
<tr><td>(i)</td><td>Operating Temperature Range</td><td>::</td><td>upto 40ºC</td></tr>
<tr><td>(ii)</td><td>Humidity</td><td>::</td><td>upto 95% Rh</td></tr>
<tr><td>15.</td><td>Noise level (at 1 meter)</td><td>::</td><td>< 45 dB</td></tr>
</table>

16.	Conformance to Standards	::	
(i)	Performance	::	IEC 62040-3
(ii)	EMC Standards	::	IEC62040-2
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply with the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.

Warranty and AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) With external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
Hitachi, Panasonic, Global Yuasa, Yuasa, Base , Exide, Amara raja, or Rocket.

c) Quote should indicate the Model/Series Name and Model Number of UPS

d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

TECHNICAL SPECIFICATIONS

3kVA UPS True On Line, Sine wave Output

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

<table>
<tr><th>Sl. No.</th><th>Specification</th><th></th><th>Parameters</th></tr>
<tr><td>1.</td><td>Input Voltage Range @ F.L</td><td>::</td><td>170V-270V AC</td></tr>
<tr><td>2.</td><td>Input Power Factor @ F.L</td><td>::</td><td>> 0.95</td></tr>
<tr><td>3.</td><td>Input Frequency Variation</td><td>::</td><td>50 Hz ± 5%</td></tr>
<tr><td>4.</td><td>Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment</td><td>::</td><td>
<table>
<tr><td rowspan="2">Backup time</td><td colspan="2">Watt Hr. Required</td></tr>
<tr><td>96 V Bus</td><td>192 V Bus</td></tr>
<tr><td>For 30 Min</td><td>> 2880 Watt Hr</td><td>> 2880 Watt Hr</td></tr>
<tr><td>For 60 Min</td><td>> 6240 Watt Hr</td><td>> 4608 Watt Hr</td></tr>
</table>
</td></tr>
<tr><td>5.</td><td>AC Output Voltage and steady state Regulation @ F.L</td><td>::</td><td>230V AC; better than ± 1%</td></tr>
<tr><td>6.</td><td>Transient Voltage Regulation at Step Load</td><td>::</td><td>< 5%</td></tr>
<tr><td>7.</td><td>Maximum deliverable continuous Output Power</td><td>::</td><td>> 2400W</td></tr>
<tr><td>8.</td><td>Output Frequency</td><td>::</td><td>50 Hz ± 4%(Synchronous to mains)
50 Hz ±0.5%(Free running).</td></tr>
<tr><td>9.</td><td>Efficiency</td><td>::</td><td></td></tr>
<tr><td>(i)</td><td>Battery mode</td><td>::</td><td>> 83%</td></tr>
<tr><td>(ii)</td><td>Mains mode</td><td>::</td><td>> 85%</td></tr>
<tr><td>10.</td><td>THD @ F.L</td><td>::</td><td>< 3% (for linear load); <5% (for nonlinear load)</td></tr>
<tr><td>11.</td><td>Crest Factor @ F.L</td><td>::</td><td>> 3 : 1</td></tr>
<tr><td>12.</td><td>Over Load Duration @ 110%, 125% and 150% of F.L</td><td>::</td><td>5 min, 1 min and 2 sec respectively</td></tr>
<tr><td>13.</td><td>Static bypass switch</td><td>::</td><td>Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.</td></tr>
<tr><td>14.</td><td>Temperature and Humidity</td><td>::</td><td></td></tr>
<tr><td>(i)</td><td>Operating Temperature Range</td><td>::</td><td>upto 40ºC</td></tr>
<tr><td>(ii)</td><td>Humidity</td><td>::</td><td>upto 95% Rh</td></tr>
<tr><td>15.</td><td>Noise level (at 1 meter)</td><td>::</td><td>< 45 dB</td></tr>
<tr><td>16.</td><td>Conformance to Standards</td><td>::</td><td></td></tr>
<tr><td>(i)</td><td>Performance</td><td>::</td><td>IEC 62040-3</td></tr>
<tr><td>(ii)</td><td>EMC Standards</td><td>::</td><td>IEC62040-2</td></tr>
</table>

(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply with the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
Hitachi, Panasonic, Global Yuasa, Yuasa, Exide, Amara raja or Rocket.

c) Quote should indicate the Model/Series Name and Model Number of UPS

d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

TECHNICAL SPECIFICATIONS

5kVA UPS True On Line, Sine wave Output

Technology:PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters
1.	Input Voltage Range @ F.L	::	180V-270V AC
2.	Input Power Factor @ F.L	::	> 0.95
3.	Input Frequency Variation	::	50 Hz ± 5%
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required (192 V): For 30 Min – > 4608 Watt Hr; For 60 Min – > 7680 Watt Hr
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%
6.	Transient Voltage Regulation at Step Load	::	< 5%
7.	Maximum deliverable continuous Output Power	::	> 4000W
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).
9.	Efficiency	::	
(i)	Battery mode	::	> 87%
(ii)	Mains mode	::	> 85%
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)
11.	Crest Factor @ F.L	::	> 3 : 1
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.
14.	Temperature and Humidity	::	
(i)	Operating Temperature Range	::	upto 40ºC
(ii)	Humidity	::	upto 95% Rh
15.	Noise level (at 1 meter)	::	< 45 dB
16.	Conformance to Standards	::	
(i)	Performance	::	IEC 62040-3

(ii)	EMC Standards	::	IEC62040-2
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply with the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.

b) Current limiting, over load and Short circuit protection.

c) Phase locking mechanism with mains frequency.

d) Over voltage / Under voltage protection.

e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
Hitachi, Panasonic, Global Yuasa, Yuasa, Exide, Amara raja or Rocket.

c) Quote should indicate the Model/Series Name and Model Number of UPS

d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified

TECHNICAL SPECIFICATIONS

10kVA UPS True On Line, Sine wave Output (3 i/p &1 o/p)

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

<table>
<tr><th>Sl. No.</th><th>Specification</th><th></th><th>Parameters</th></tr>
<tr><td>1.</td><td>Input Voltage Range @ F.L</td><td>::</td><td>374V-506 V AC</td></tr>
<tr><td>2.</td><td>Input Power Factor @ F.L</td><td>::</td><td>> 0.95</td></tr>
<tr><td>3.</td><td>Input Frequency Variation</td><td>::</td><td>50 Hz ± 5%</td></tr>
<tr><td>4.</td><td>Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment</td><td>::</td><td><table><tr><td>Backup time</td><td>Watt Hr. Required
240 V Bus</td></tr><tr><td>For 30 Min</td><td>> 9600 Watt Hr</td></tr><tr><td>For 60 Min</td><td>> 15600 Watt Hr</td></tr></table></td></tr>
<tr><td>5.</td><td>AC Output Voltage and steady state Regulation @ F.L</td><td>::</td><td>230V AC; better than ± 1%</td></tr>
<tr><td>6.</td><td>Transient Voltage Regulation at Step Load</td><td>::</td><td>< 5%</td></tr>
<tr><td>7.</td><td>Maximum deliverable continuous Output Power</td><td>::</td><td>> 8000W</td></tr>
<tr><td>8.</td><td>Output Frequency</td><td>::</td><td>50 Hz ± 4%(Synchronous to mains)
50 Hz ±0.5%(Free running).</td></tr>
<tr><td>9.</td><td>Efficiency</td><td>::</td><td></td></tr>
<tr><td>(i)</td><td>Battery mode</td><td>::</td><td>> 84%</td></tr>
<tr><td>(ii)</td><td>Mains mode</td><td>::</td><td>> 89%</td></tr>
<tr><td>10.</td><td>THD @ F.L</td><td>::</td><td>< 3% (for linear load); <5% (for nonlinear load)</td></tr>
<tr><td>11.</td><td>Crest Factor @ F.L</td><td>::</td><td>> 3 : 1</td></tr>
<tr><td>12.</td><td>Over Load Duration @ 110%, 125% and 150% of F.L</td><td>::</td><td>5 min, 1 min and 2 sec respectively</td></tr>
<tr><td>13.</td><td>Static bypass switch</td><td>::</td><td>Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.</td></tr>
<tr><td>14.</td><td>Temperature and Humidity</td><td>::</td><td></td></tr>
<tr><td>(i)</td><td>Operating Temperature Range</td><td>::</td><td>upto 40ºC</td></tr>
<tr><td>(ii)</td><td>Humidity</td><td>::</td><td>upto 95% Rh</td></tr>
<tr><td>15.</td><td>Noise level (at 1 meter)</td><td>::</td><td>< 45 dB</td></tr>
<tr><td>16.</td><td>Conformance to Standards</td><td>::</td><td></td></tr>
</table>

(i)	Performance	::	IEC 62040-3
(ii)	EMC Standards	::	IEC62040-2
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.

b) Current limiting, over load and Short circuit protection.

c) Phase locking mechanism with mains frequency.

d) Over voltage / under voltage protection.

e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.

c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL SPECIFICATIONS

10kVA UPS True On Line, Sine wave Output (1i/p & 1 o/p)

Technology:PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

<table>
<tr><th>Sl. No.</th><th>Specification</th><th></th><th>Parameters</th></tr>
<tr><td>1.</td><td>Input Voltage Range @ F.L</td><td>::</td><td>180V-270V AC</td></tr>
<tr><td>2.</td><td>Input Power Factor @ F.L</td><td>::</td><td>> 0.95</td></tr>
<tr><td>3.</td><td>Input Frequency Variation</td><td>::</td><td>50 Hz ± 5%</td></tr>
<tr><td>4.</td><td>Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment</td><td>::</td><td><table><tr><td>Backup time</td><td>Watt Hr. Required
240 V Bus</td></tr><tr><td>For 30 Min</td><td>> 9600 Watt Hr</td></tr><tr><td>For 60 Min</td><td>> 15600 Watt Hr</td></tr></table></td></tr>
<tr><td>5.</td><td>AC Output Voltage and steady state Regulation @ F.L</td><td>::</td><td>230V AC; better than ± 1%</td></tr>
<tr><td>6.</td><td>Transient Voltage Regulation at Step Load</td><td>::</td><td>< 5%</td></tr>
<tr><td>7.</td><td>Maximum deliverable continuous Output Power</td><td>::</td><td>> 8000W</td></tr>
<tr><td>8.</td><td>Output Frequency</td><td>::</td><td>50 Hz ± 4%(Synchronous to mains)
50 Hz ±0.5%(Free running).</td></tr>
<tr><td>9.</td><td>Efficiency</td><td>::</td><td></td></tr>
<tr><td>(i)</td><td>Battery mode</td><td>::</td><td>> 84%</td></tr>
<tr><td>(ii)</td><td>Mains mode</td><td>::</td><td>> 89%</td></tr>
<tr><td>10.</td><td>THD @ F.L</td><td>::</td><td>< 3% (for linear load); <5% (for nonlinear load)</td></tr>
<tr><td>11.</td><td>Crest Factor @ F.L</td><td>::</td><td>> 3 : 1</td></tr>
<tr><td>12.</td><td>Over Load Duration @ 110%, 125% and 150% of F.L</td><td>::</td><td>5 min, 1 min and 2 sec respectively</td></tr>
<tr><td>13.</td><td>Static bypass switch</td><td>::</td><td>Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.</td></tr>
<tr><td>14.</td><td>Temperature and Humidity</td><td>::</td><td></td></tr>
<tr><td>(i)</td><td>Operating Temperature Range</td><td>::</td><td>upto 40ºC</td></tr>
<tr><td>(ii)</td><td>Humidity</td><td>::</td><td>upto 95% Rh</td></tr>
<tr><td>15.</td><td>Noise level (at 1 meter)</td><td>::</td><td>< 55 dB</td></tr>
<tr><td>16.</td><td>Conformance to Standards</td><td>::</td><td></td></tr>
</table>

(i)	Performance	::	IEC 62040-3
(ii)	EMC Standards	::	IEC62040-2
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.

b) Current limiting, over load and Short circuit protection.

c) Phase locking mechanism with mains frequency.

d) Over voltage / Under voltage protection.

e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
Hitachi, Panasonic, Global Yuasa, Exide, Amaraja or Rocket.

c) Quote should indicate the Model/Series Name and Model Number of UPS

d) Test report from the accredited laboratory should be provided for the model quoted in the technical bid for the standards specified.

15kVA UPS True On Line, Sine wave Output (3 i/p & 1 o/p)

Technology:PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters
1.	Input Voltage Range @ F.L	::	415V ± 15%
2.	Input Power Factor @ F.L	::	> 0.93
3.	Input Frequency Variation	::	50 Hz ± 5%
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required (240 V Bus): For 30 Min > 15600 Watt Hr; For 60 Min > 24000 Watt Hr
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%
6.	Transient Voltage Regulation at Step Load	::	< 5%
7.	Maximum deliverable continuous Output Power	::	> 12000W
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).
9.	Efficiency	::	
(i)	Battery mode	::	> 84%
(ii)	Mains mode	::	> 89%
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)
11.	Crest Factor @ F.L	::	> 3 : 1
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.
14.	Temperature and Humidity	::	
(i)	Operating Temperature Range	::	upto 40ºC
(ii)	Humidity	::	upto 95% Rh
15.	Noise level (at 1 meter)	::	< 55 dB
16.	Conformance to Standards	::	
(i)	Performance	::	IEC 62040-3
(ii)	EMC Standards	::	IEC62040-2

(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. Should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
c) Quote should indicate the Model/Series Name and Model Number of UPS.

TECHNICAL SPECIFICATIONS

15kVA UPS True On Line, Sine wave Output (3 ø i/p &3 ø o/p)

Technology:PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters
1.	Input Voltage Range @ F.L	::	415V ± 15%
2.	Input Power Factor @ F.L	::	> 0.93
3.	Input Frequency Variation	::	50 Hz ± 5%
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required (240 V Bus): For 30 Min > 15600 Watt Hr; For 60 Min > 24000 Watt Hr
5a.	AC Output Voltage and steady state Regulation @ F.L	::	415 V AC; <1% (for balanced load) <2% (for 100% unbalanced load)
5b.	Phase displacement	::	<1% (for balanced load) <2% (for 100% unbalanced load)
6.	Transient Voltage Regulation at Step Load	::	< 5%
7.	Maximum deliverable continuous Output Power	::	> 12000W
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).
9.	Efficiency	::	
(i)	Battery mode	::	> 84%
(ii)	Mains mode	::	> 89%
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)
11.	Crest Factor @ F.L	::	> 3 : 1
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.
14.	Temperature and Humidity	::	
(i)	Operating Temperature Range	::	upto 40ºC
(ii)	Humidity	::	upto 95% Rh

15.	Noise level (at 1 meter)	::	< 55 dB
16.	Conformance to Standards	::	
(i)	Performance	::	IEC 62040-3
(ii)	EMC Standards	::	IEC62040-2
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) With built- in isolation transformer and 30 minutes back up time.
   (ii) With built- in isolation transformer and one hour back up time.
   (iii) With external isolation transformer and 30 minutes back up time.
   (iv) With external isolation transformer and one hour back up time.
b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
c) Quote should indicate the Model/Series Name and Model Number of UPS
d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

TECHNICAL SPECIFICATIONS

20kVA UPS True On Line, Sine wave Output(3 i/p & 1 o/p)

Technology:PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters
1.	Input Voltage Range @ F.L	::	415V ± 15%
2.	Input Power Factor @ F.L	::	> 0.95
3.	Input Frequency Variation	::	50 Hz ± 5%
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required (240 V Bus): For 30 Min – > 15600 Watt Hr; For 60 Min – > 24000 Watt Hr
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%
6.	Transient Voltage Regulation at Step Load	::	< 5%
7.	Maximum deliverable continuous Output Power	::	> 16000W
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).
9.	Efficiency	::	
(i)	Battery mode	::	> 84%
(ii)	Mains mode	::	> 89%
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)
11.	Crest Factor @ F.L	::	> 3 : 1
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.
14.	Temperature and Humidity	::	
(i)	Operating Temperature Range	::	upto 40ºC
(ii)	Humidity	::	upto 95% Rh
15.	Noise level (at 1 meter)	::	< 55 dB
16.	Conformance to Standards	::	

(i)	Performance	::	IEC 62040-3
(ii)	EMC Standards	::	IEC62040-2
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. Should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.
b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
c) Quote should indicate the Model/Series Name and Model Number of UPS
d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

TECHNICAL SPECIFICATIONS

20kVA UPS True On Line, Sine wave Output(3 i/p &3 o/p)

Technology:PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters
1.	Input Voltage Range @ F.L	::	415V ± 15%
2.	Input Power Factor @ F.L	::	> 0.95
3.	Input Frequency Variation	::	50 Hz ± 5%
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required (240 V Bus): For 30 Min > 15600 Watt Hr; For 60 Min > 24000 Watt Hr
5a.	AC Output Voltage and steady state Regulation @ F.L	::	415 V AC; <1% (for balanced load) <2% (for 100% unbalanced load)
5b.	Phase displacement	::	<1% (for balanced load) <2% (for 100% unbalanced load)
6.	Transient Voltage Regulation at Step Load	::	< 5%
7.	Maximum deliverable continuous Output Power	::	> 16000W
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).
9.	Efficiency	::	
(i)	Battery mode	::	> 84%
(ii)	Mains mode	::	> 89%
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)
11.	Crest Factor @ F.L	::	> 3 : 1
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.
14.	Temperature and Humidity	::	
(i)	Operating Temperature Range	::	upto 40ºC
(ii)	Humidity	::	upto 95% Rh
15.	Noise level (at 1 meter)	::	< 55 dB
16.	Conformance to	::	

	Standards		
(i)	Performance	::	IEC 62040-3
(ii)	EMC Standards	::	IEC62040-2
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. Should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) With built- in isolation transformer and 30 minutes back up time.
   (ii) With built- in isolation transformer and one hour back up time.
   (iii) With external isolation transformer and 30 minutes back up time.
   (iv) With external isolation transformer and one hour back up time.
b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
c) Quote should indicate the Model/Series Name and Model Number of UPS
d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

ANNEXURE -A

TECHNICAL SPECIFICATIONS

30kVA UPS True On Line, Sine wave Output(3 i/p & 1 o/p)

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters
1.	Input Voltage Range @ F.L	::	415V ± 15%
2.	Input Power Factor @ F.L	::	> 0.93
3.	Input Frequency Variation	::	50 Hz ± 5%
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required (360 V Bus): For 30 Min > 28800 Watt Hr; For 60 Min > 46800 Watt Hr
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%
6.	Transient Voltage Regulation at Step Load	::	< 5%
7.	Maximum deliverable continuous Output Power	::	> 24000W
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).
9.	Efficiency	::	
(i)	Battery mode	::	> 84%
(ii)	Mains mode	::	> 89%
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)
11.	Crest Factor @ F.L	::	> 3 : 1
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.
14.	Temperature and Humidity	::	
(i)	Operating Temperature Range	::	upto 40ºC
(ii)	Humidity	::	upto 95% Rh
15.	Noise level (at 1 meter)	::	< 55 dB
16.	Conformance to	::	

	Standards		
(i)	Performance	::	IEC 62040-3
(ii)	EMC Standards	::	IEC62040-2
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features.It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. Should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.
b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
c) Quote should indicate the Model/Series Name and Model Number of UPS
d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

TECHNICAL SPECIFICATIONS

30kVA UPS True On Line, Sine wave Output(3 i/p &3 o/p)

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters
1.	Input Voltage Range @ F.L	::	415V ± 15%
2.	Input Power Factor @ F.L	::	> 0.93
3.	Input Frequency Variation	::	50 Hz ± 5%
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required (360 V Bus): For 30 Min > 28800 Watt Hr; For 60 Min > 46800 Watt Hr
5a.	AC Output Voltage and steady state Regulation @ F.L	::	415 V AC; <1% (for balanced load) <2% (for 100% unbalanced load)
5b.	Phase displacement	::	<1% (for balanced load) <2% (for 100% unbalanced load)
6.	Transient Voltage Regulation at Step Load	::	< 5%
7.	Maximum deliverable continuous Output Power	::	> 24000W
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).
9.	Efficiency	::	
(i)	Battery mode	::	> 84%
(ii)	Mains mode	::	> 89%
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)
11.	Crest Factor @ F.L	::	> 3 : 1
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.
14.	Temperature and Humidity	::	
(i)	Operating Temperature Range	::	upto 40ºC
(ii)	Humidity	::	upto 95% Rh

15.	Noise level (at 1 meter)	::	< 55 dB
16.	Conformance to Standards	::	
(i)	Performance	::	IEC 62040-3
(ii)	EMC Standards	::	IEC62040-2
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.
b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
c) Quote should indicate the Model/Series Name and Model Number of UPS
d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

ANNEXURE - B

TECHNCIAL BID COMPLIANCE STATEMENT

Sl. No.	Description	YES / NO	Page no. of attached document
1.	Authorized Dealership Certificate from the manufacturer attached		
2.	Product catalogue attached		
3.	Test certificate for the UPS for each models		

1kVA UPS True On Line, Sine wave Output without isolation transformer

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs.

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	180V-270V AC		
2.	Input Power Factor @ F.L	::	> 0.95		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time: Watt Hr. Required; 36V Bus / 48V Bus; 15 Mins: >250 Watt Hr / >250 Hr		
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	>800W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ± 0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 80%		
(ii)	Mains mode	::	> 80%		
10.	THD @ F.L	::	<3% (for linear load); <5%(for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	Up to 40ºC		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 45 dB		
16.	Conformance to Standards	::			
(i)	Performance	::	IEC 62040-3		

(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply with the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Current limiting, over load and Short circuit protection.

b) Phase locking mechanism with mains frequency.

c) Over voltage / under voltage protection.

d) All other protection systems as required for safety of the system.

Warranty and AMC

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period

Important instructions:

d) Quote should indicate the Model/Series Name and Model Number of UPS
e) Batteries must be SMF type of following make:
Hitachi, Panasonic, Global Yuasa, Yuasa, Base, Exide, Amara raja or Rocket.
f) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

TECHNICAL BID

1kVA UPS True On Line, Sine wave Output

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	180V-270V AC		
2.	Input Power Factor @ F.L	::	> 0.95		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required (36V Bus / 48V Bus): For 30 Min: > 864 Watt Hr / > 864 Watt Hr; For 60 Min: > 1440 Watt Hr / > 1440 Watt Hr		
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 800W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 80%		
(ii)	Mains mode	::	> 80%		
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	upto 40ºC		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 45 dB		
16.	Conformance to Standards	::			
(i)	Performance	::	IEC 62040-3		

(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply with the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.

Warranty and AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
Hitachi, Panasonic, Global Yuasa, Yuasa, Base, Exide, Amara raja or Rocket.

F) Quote should indicate the Model/Series Name and Model Number of UPS

G) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

ANNEXURE -B

TECHNICAL BID

2kVA UPS True On Line, Sine wave Output

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Fre switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	170V-270V AC		
2.	Input Power Factor @ F.L	::	> 0.95		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required: 48V Bus / 72 / 96 V Bus For 30 Min: > 2016 Watt Hr / > 2304 Watt Hr For 60 Min: > 3120 Watt Hr / > 3648 Watt Hr		
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 1600W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 80%		
(ii)	Mains mode	::	> 80%		
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	upto 40ºC		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 45 dB		

16.	Conformance to Standards	::			
(i)	Performance	::	IEC 62040-3		
(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply with the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.

Warranty and AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) With external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
Hitachi, Panasonic, Global Yuasa, Yuasa, Base , Exide, Amara raja, or Rocket.

c) Quote should indicate the Model/Series Name and Model Number of UPS

d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

TECHNICAL BID

3kVA UPS True On Line, Sine wave Output

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	170V-270V AC		
2.	Input Power Factor @ F.L	::	> 0.95		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	<table><tr><td rowspan="2">Backup time</td><td colspan="2">Watt Hr. Required</td></tr><tr><td>96 V Bus</td><td>192 V Bus</td></tr><tr><td>For 30 Min</td><td>> 2880 Watt Hr</td><td>> 2880 Watt Hr</td></tr><tr><td>For 60 Min</td><td>> 6240 Watt Hr</td><td>> 4608 Watt Hr</td></tr></table>		
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 2400W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 83%		
(ii)	Mains mode	::	> 85%		
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	upto 40ºC		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 45 dB		
16.	Conformance to Standards	::			
(i)	Performance	::	IEC 62040-3		

(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply with the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
Hitachi, Panasonic, Global Yuasa, Yuasa, Exide, Amara raja or Rocket.

c) Quote should indicate the Model/Series Name and Model Number of UPS

d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

ANNEXURE -B

TECHNICAL BID

5kVA UPS True On Line, Sine wave Output

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	180V-270V AC		
2.	Input Power Factor @ F.L	::	> 0.95		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time: Watt Hr. Required (192 V); For 30 Min: > 4608 Watt Hr; For 60 Min: > 7680 Watt Hr		
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 4000W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 87%		
(ii)	Mains mode	::	> 85%		
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	upto 40ºC		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 45 dB		
16.	Conformance to Standards	::			

(i)	Performance	::	IEC 62040-3		
(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply with the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.

b) Current limiting, over load and Short circuit protection.

c) Phase locking mechanism with mains frequency.

d) Over voltage / Under voltage protection.

e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
Hitachi, Panasonic, Global Yuasa, Yuasa, Exide, Amara raja or Rocket.

c) Quote should indicate the Model/Series Name and Model Number of UPS

d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified

TECHNICAL BID

10kVA UPS True On Line, Sine wave Output (3 i/p &1 o/p)

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	374V-506 V AC		
2.	Input Power Factor @ F.L	::	> 0.95		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time: Watt Hr. Required (240 V Bus); For 30 Min: > 9600 Watt Hr; For 60 Min: > 15600 Watt Hr		
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 8000W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 84%		
(ii)	Mains mode	::	> 89%		
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	upto 40ºC		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 45 dB		

16.	Conformance to Standards	::			
(i)	Performance	::	IEC 62040-3		
(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.

b) Current limiting, over load and Short circuit protection.

c) Phase locking mechanism with mains frequency.

d) Over voltage / under voltage protection.

e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.

c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL BID

10kVA UPS True On Line, Sine wave Output (1i/p & 1 o/p)

Technology:PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	180V-270V AC		
2.	Input Power Factor @ F.L	::	> 0.95		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required (240 V Bus): For 30 Min > 9600 Watt Hr; For 60 Min > 15600 Watt Hr		
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 8000W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 84%		
(ii)	Mains mode	::	> 89%		
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	upto 40ºC		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 55 dB		
16.	Conformance to	::			

	Standards				
(i)	Performance	::	IEC 62040-3		
(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.

b) Current limiting, over load and Short circuit protection.

c) Phase locking mechanism with mains frequency.

d) Over voltage / Under voltage protection.

e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
Hitachi, Panasonic, Global Yuasa, Exide, Amaraja or Rocket.

c) Quote should indicate the Model/Series Name and Model Number of UPS

d) Test report from the accredited laboratory should be provided for the model quoted in the technical bid for the standards specified.

TECHNICAL BID

15kVA UPS True On Line, Sine wave Output (3 i/p & 1 o/p)

Technology:PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	415V ± 15%		
2.	Input Power Factor @ F.L	::	> 0.93		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time: Watt Hr. Required (240 V Bus); For 30 Min: > 15600 Watt Hr; For 60 Min: > 24000 Watt Hr		
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 12000W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 84%		
(ii)	Mains mode	::	> 89%		
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	upto 40ºC		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 55 dB		
16.	Conformance to Standards	::			

(i)	Performance	::	IEC 62040-3		
(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. Should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.

b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
c) Quote should indicate the Model/Series Name and Model Number of UPS.

TECHNICAL BID

15kVA UPS True On Line, Sine wave Output (3 ø i/p &3 ø o/p)

Technology:PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	415V ± 15%		
2.	Input Power Factor @ F.L	::	> 0.93		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required (240 V Bus): For 30 Min > 15600 Watt Hr; For 60 Min > 24000 Watt Hr		
5a.	AC Output Voltage and steady state Regulation @ F.L	::	415 V AC; <1% (for balanced load) <2% (for 100% unbalanced load)		
5b.	Phase displacement	::	<1% (for balanced load) <2% (for 100% unbalanced load)		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 12000W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 84%		
(ii)	Mains mode	::	> 89%		
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	upto 40ºC		
(ii)	Humidity	::	upto 95% Rh		

15.	Noise level (at 1 meter)	::	< 55 dB		
16.	Conformance to Standards	::			
(i)	Performance	::	IEC 62040-3		
(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) With built- in isolation transformer and 30 minutes back up time.
   (ii) With built- in isolation transformer and one hour back up time.
   (iii) With external isolation transformer and 30 minutes back up time.
   (iv) With external isolation transformer and one hour back up time.
b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
c) Quote should indicate the Model/Series Name and Model Number of UPS
d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

TECHNICAL BID

20kVA UPS True On Line, Sine wave Output(3 i/p & 1 o/p)

Technology:PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	415V ± 15%		
2.	Input Power Factor @ F.L	::	> 0.95		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required 240 V Bus: For 30 Min > 15600 Watt Hr; For 60 Min > 24000 Watt Hr		
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 16000W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 84%		
(ii)	Mains mode	::	> 89%		
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	upto 40ºC		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 55 dB		
16.	Conformance to Standards	::			

(i)	Performance	::	IEC 62040-3		
(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. Should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.
b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
c) Quote should indicate the Model/Series Name and Model Number of UPS
d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

TECHNICAL BID

20kVA UPS True On Line, Sine wave Output(3 i/p &3 o/p)

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	415V ± 15%		
2.	Input Power Factor @ F.L	::	> 0.95		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time: Watt Hr. Required (240 V Bus); For 30 Min: > 15600 Watt Hr; For 60 Min: > 24000 Watt Hr		
5a.	AC Output Voltage and steady state Regulation @ F.L	::	415 V AC; <1% (for balanced load) <2% (for 100% unbalanced load)		
5b.	Phase displacement	::	<1% (for balanced load) <2% (for 100% unbalanced load)		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 16000W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 84%		
(ii)	Mains mode	::	> 89%		
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	upto 40ºC		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 55 dB		

16.	Conformance to Standards	::			
(i)	Performance	::	IEC 62040-3		
(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. Should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) With built- in isolation transformer and 30 minutes back up time.
   (ii) With built- in isolation transformer and one hour back up time.
   (iii) With external isolation transformer and 30 minutes back up time.
   (iv) With external isolation transformer and one hour back up time.
b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
c) Quote should indicate the Model/Series Name and Model Number of UPS
d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

ANNEXURE -B

TECHNICAL BID

30kVA UPS True On Line, Sine wave Output(3 i/p & 1 o/p)

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	415V ± 15%		
2.	Input Power Factor @ F.L	::	> 0.93		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time / Watt Hr. Required (360 V Bus): For 30 Min > 28800 Watt Hr; For 60 Min > 46800 Watt Hr		
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than ± 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 24000W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 84%		
(ii)	Mains mode	::	> 89%		
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	upto 40ºC		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 55 dB		

16.	Conformance to Standards	::			
(i)	Performance	::	IEC 62040-3		
(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features.It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / Under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. Should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.
b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
c) Quote should indicate the Model/Series Name and Model Number of UPS
d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

TECHNICAL BID

30kVA UPS True On Line, Sine wave Output(3 i/p &3 o/p)

Technology: PWM technology in True on-line operation, employing double conversion method using MOSFETs / IGBTs..

Method of Inversion: Adaptive pulse width modulation or weighted pulse width modulation with high Frequency switching (>10 kHz for MOSFETs and >5 kHz for IGBTs).

Test Parameter

Sl. No.	Specification		Parameters	Compliance (Yes/No.)	If No, specify exact specification
1.	Input Voltage Range @ F.L	::	415V ± 15%		
2.	Input Power Factor @ F.L	::	> 0.93		
3.	Input Frequency Variation	::	50 Hz ± 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time: Watt Hr. Required (360 V Bus); For 30 Min: > 28800 Watt Hr; For 60 Min: > 46800 Watt Hr		
5a.	AC Output Voltage and steady state Regulation @ F.L	::	415 V AC; <1% (for balanced load) <2% (for 100% unbalanced load)		
5b.	Phase displacement	::	<1% (for balanced load) <2% (for 100% unbalanced load)		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 24000W		
8.	Output Frequency	::	50 Hz ± 4%(Synchronous to mains) 50 Hz ±0.5%(Free running).		
9.	Efficiency	::			
(i)	Battery mode	::	> 84%		
(ii)	Mains mode	::	> 89%		
10.	THD @ F.L	::	< 3% (for linear load); <5% (for nonlinear load)		
11.	Crest Factor @ F.L	::	> 3 : 1		
12.	Over Load Duration @ 110%, 125% and 150% of F.L	::	5 min, 1 min and 2 sec respectively		
13.	Static bypass switch	::	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to Bypass and vice-versa.		
14.	Temperature and Humidity	::			
(i)	Operating Temperature Range	::	upto 40ºC		
(ii)	Humidity	::	upto 95% Rh		

15.	Noise level (at 1 meter)	::	< 55 dB		
16.	Conformance to Standards	::			
(i)	Performance	::	IEC 62040-3		
(ii)	EMC Standards	::	IEC62040-2		
(iii)	Safety Standard	::	IEC 62040-1 Critical components in the UPS should comply the safety standard requirement.		

Battery Charger Operation:

Float-cum-boost charger with automatic boost/trickle charger modes with current limiting features. It's characteristics shall be such as to match the float/ boost charging of the batteries as per battery characteristic, for battery life enhancement. High frequency chargers preferred.

Protection Features:

a) Isolation - Output shall be fully isolated from mains and with surge /spike suppressors incorporated.
b) Current limiting, over load and Short circuit protection.
c) Phase locking mechanism with mains frequency.
d) Over voltage / under voltage protection.
e) All other protection systems as required for safety of the system.

Other Features:

1. Cold start feature under full load condition.
2. Standard hardware / software support for serial communication interface and SNMP / Web monitoring.
3. Auto shut down and energy saving features.
4. Temperature compensated battery charging for battery life enhancement.
3. Automated battery testing and advanced battery management features.
4. Sufficient ventilation and forced air cooling through fans.
5. Documentation/Manuals support for component level Servicing.
6. Serviceability at component level.
7. Spares and accessories deliverable along with UPS for Servicing.
8. should able provide cable feed from top or bottom of UPS

WARRANTY AND AMC:

1. 3 years Warranty Period for UPS as well as Batteries.
2. Comprehensive AMC covering the batteries, after the expiry of warranty period for the configurations (i) to (iv) given below.

Important instructions:

a) Separate quote is invited for each one of the following configurations:
   (i) with built- in isolation transformer and 30 minutes back up time.
   (ii) with built- in isolation transformer and one hour back up time.
   (iii) with external isolation transformer and 30 minutes back up time.
   (iv) with external isolation transformer and one hour back up time.
b) Batteries must be SMF type of following make:
   Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
c) Quote should indicate the Model/Series Name and Model Number of UPS
d) Test report from the accredited laboratory should be provided in the technical bid for the standards specified.

ANNEXURE - C

PRICE BID FORMAT (BOQ)

Sl. No.	Description	Unit Price	Tax	Total
1.	1kVA UPS True On Line, without isolation transformer - 15 Mins			

Sl. No.	Description	Unit Price **With external** isolation transformer	Tax	**Total cost**	Unit price **with built-in** isolation transformer	Tax	**Total cost**
1.	1kVA UPS - 30 Mins						
2.	2kVA UPS - 30 Mins						
3.	3kVA UPS - 30 Mins						
4.	5kVA UPS - 30 Mins						
5.	10kVA UPS (3 i/p & 1 o/p) - 30 Mins						
6.	10kVA UPS (1 i/p & 1 o/p) - 30 Mins						
7.	15kVA UPS (3 i/p & 1 o/p) - 30 Mins						
8.	15kVA UPS (3 i/p & 3 o/p) - 30 Mins						
9.	20kVA UPS (3 i/p & 1 o/p) - 30 Mins						
10.	20kVA UPS (3 i/p & 3 o/p) - 30 Mins						
11.	30kVA UPS (3 i/p & 1 o/p) - 30 Mins						
12.	30kVA UPS (3 i/p & 3 o/p) - 30 Mins						
13.	1kVA UPS - 60 Mins						
14.	2kVA UPS - 60 Mins						
15.	3kVA UPS - 60 Mins						
16.	5kVA UPS - 60 Mins						
17.	10kVA UPS (3 i/p & 1 o/p) - 60 Mins						
18.	10kVA UPS (1 i/p & 1 o/p) - 60 Mins						
19.	15kVA (3 i/p & 1 o/p) - 60 Mins						
20.	15kVA (3 i/p & 3 o/p) - 60 Mins						
21.	20kVA (3 i/p & 1o/p) - 60 Mins						
22.	20kVA (3 i/p & 3 o/p) - 60 Mins						
23.	30kVA (3 i/p & 1 o/p) - 60 Mins						
24.	30kVA (3 i/p & 3 o/p) - 60 Mins						

SIGNATURE OF TENDERER ALONG WITHSEAL OF THE COMPANY WITH DATE

SCHEDULE

Tender Reference No	**IITM/SPS /UPS-RC/Tech Enq./001/2019-20/SPL**
Tender Type (Open/Limited/EOI/Auction/Single)	Open Tender
Tender Category (Services/Goods/works)	GOODS
Type/Form of Contract (Work/Supply/ Auction/ Service/ Buy/ Empanelment/ Sell)	Supply
Product Category (Civil Works/Electrical Works/Fleet Management/ Computer Systems)	UPS System with batteries
Is Multi Currency Allowed	NO
Date of Issue/Publishing	02.04.2019
Document Download/Sale Start Date	02.04.2019
Document Download/Sale End Date	25.04.2019
Date for Pre-Bid Conference	Not applicable
Last Date and Time for Uploading of Bids	25.04.2019 before 2.00 PM
Date and Time of Opening of Technical Bid	26.04.2019 at 3.00 PM
EMD	Rs. 20,000/-
No. of Covers (1/2/3/4)	2
Bid Validity days (180/120/90/60/30)	60 days
Address for Communication for Sample Submission	The Head Central Electronics Centre Indian Institute of Technology Madras Chennai – 600 036 Phone No. 044-2257 4945 Contact Person: Dr. C.R. Jeevandoss, Instrumentation Engineer, CEC
Contact No.	For Queries : 044- 2257 4947 / 2257 8288/8287
Email Address	jeevandoss@iitm.ac.in adstores@iitm.ac.in