



भारतीय प्रौद्योगिकीसंस्थानमद्रासचेन्ने 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 : 33AAAI3615G1Z6



G. Chitrapavai
Deputy Registrar (Stores & Purchase)

Dated : 10.11.2017

Tender No. IITM/SPS /RC/UPS/Tech Enq./008/2017-18/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)”

confirming to the specifications enclosed.

Tender Documents may be downloaded from Central Public Procurement Portal <https://etenders.gov.in/e procure/app>. Aspiring Bidders who have not enrolled / registered in eprocurement should enroll / register before participating through the website <https://etenders.gov.in/e procure/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/e procure/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	:	20.11.2017 before 2.00 p.m
	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	:	20.11.2017 before 2.00 pm
	Date & Time of opening of Tender – TECHNICAL BID	:	21.11.2017 at 3.00 pm
	Date & Time of Price Bid Opening	:	Will be intimated through e-tenders portal after opening of Technical Bid.

A	Sample Submission	<ul style="list-style-type: none"> ❖ For each model, kindly make arrangements to deliver one sample along 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 ON ACCOUNT OF POSTAL OR ANY OTHER DELAY..
B	Instructions for online bid submission	<p>REGISTRATION</p> <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.
		<ul style="list-style-type: none"> 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

D	Preparation of bids	<p>: 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.</p> <p>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.</p> <p>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.</p>
E	Submission of bids	<p>: 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.</p> <p>ii. Bids submitted will be summarily rejected if samples for testing is not submitted within the stipulated time.</p> <p>iii. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.</p> <p>iv. Bidder has to select the payment option as “Off-line” to pay the EMD as applicable. The original EMD DD has to reach IIT Madras on or before the closure date and time of the tender. If the DD is not received before the closure date and time the tender will be summarily rejected. The EMD document submitted physically to IIT Madras and the scanned copies furnished at the time of online bid submission should be the same otherwise the tender will be summarily rejected.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>viii. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.</p> <p>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.</p>

			x. Kindly add scanned PDF of all relevant documents in a single PDF file of compliance sheet.
F	Assistance to bidders	:	<p>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.</p> <p>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]</p>
G	General Instructions to the Bidders	:	<p>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.</p> <p>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</p> <p>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".</p>
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)	:	<p>i. EMD for Rs. 10,000/- has to be paid by means of DD only. The scanned copy of DD to be uploaded in the online portal and the original DD should reach us on or before the due date and time of the tender.</p> <p>ii. The original EMD DD should be sent either by REGISTERED POST ACKNOWLEDGEMENT DUE OR THROUGH MESSENGER. If the original EMD DD is sent through Messenger, the same has to be dropped in the TENDER BOX marked Stores & Purchase kept for this purpose in the REGISTRAR`S OFFICE, 1ST Floor, Administration Building, IIT Madras, Chennai – 600 036 on or before due date 20.11.2017 before 02.00 p.m.</p> <p>iii. If it is by post (Registered Post or Speed post only) the same should reach on or before due date 20.11.2017 before 02.00 p.m. otherwise it will be summarily rejected even if the scanned copy of the DD is enclosed in e-bid.</p> <p>iv. Demand Draft may be drawn in favour of "The Registrar, IIT Madras" payable at Chennai.</p> <p>The original EMD should be sent to:</p> <p>The Registrar INDIAN INSTITUTE OF TECHNOLOGY MADRAS CHENNAI- 600 036</p> <p>v. Non submission of original EMD DD on or before the due date and time will result in rejection of the e-bid even if the proof of the DD attached in the e-bids submitted by the vendor.</p>

			vi. The EMD will be returned to unsuccessful tenderer only after the tenders are finalized. In case of successful tenderer, it will be retained till the installation and completion of warranty period.
J	Marking on Technical Bid	:	<p>i. The technical Specification for this tender is given in Annexure A. The tenderer shall go through the specification and submit the technical bid.</p> <p>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.</p> <p>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.</p> <p>iv. The technical bid should consist of all technical details along with catalogue/brochure and other technical, commercial terms and conditions.</p>
K	Marking on Price Bid	:	<p>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.</p> <p>ii. Price bid should indicate item-wise price for all the items mentioned in the technical bid.</p>
2	Preparation of Tender:		
	<p>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.</p> <p>b) The offer/bids should be submitted through online only in two bid system i.e. Technical Bid and Price Bid separately.</p>		
3	Signing of Tender:		
	<p>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.</p> <p>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.</p> <p>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.</p>		
4	Period for which the offer will remain open:		
	<p>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.</p> <p>ii. Quotations qualified by such vague and indefinite expressions such as 'subject to immediate acceptance', 'subject to prior sale' will not be considered.</p> <p>ii. The Tender shall remain open for acceptance/validity till: 60 days from the date of opening of the tender.</p>		
5	Prices:		
	<p>i. The prices quoted must be nett. per unit as per the technical specification mentioned in Annexure A and must include all packing, delivery and installation charges and other statutory</p>		

	<p>levies. The prices quoted by the Tenderer should be inclusive of GST and other statutory levies (and should be clearly stated to be so) which will be paid by the Purchaser/if legally leviable at the rate ruling on the date of supply as specified in the Acceptance of Tender. The percentage of tax etc. included in the price should be indicated in clear terms. If the inclusive 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 are bound to supply as per the offered rate, i.e. without taxes etc.</p> <p>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</p> <p>iii. Discount, if any, should be indicated prominently. For bulk orders, the % of discount offered may also be indicated in the following slabs.</p> <p style="text-align: center;">(i) 2 to 10 Nos. (ii) 11 to 25 Nos. (iii) 25 Nos. and above.</p> <p>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.</p>
6	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 conform 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	<p>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.</p> <ul style="list-style-type: none"> • 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	<p>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</p>

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)”

Batteries must be SMF Type of the following:

Make: Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket

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	30 Minutes & 60 Minutes
3.	10 kVA, 15 kVA, 20 kVA & 30 kVA – True Online Sine wave output with provision for 3 phase input and 1 phase output, 3 phase input and 3 phase output.	30 Minutes & 60 Minutes

TECHNICAL SPECIFICATIONS & BID

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 \pm 5%		
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time	Watt Hr. Required	
			15 Mins	>250 Watt Hr	>250 Hr
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than \pm 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	>800W		
8.	Output Frequency	::	50 Hz \pm 4%(Synchronous to mains) 50 Hz \pm 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 40°C		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 45 dB		
16.	Conformance to Standards	::			
(i)	EMC Standards	::	IEC 801-2,3,4,5		
(ii)	Emission Standard	::	EN55022 Class B		
(iii)	Safety Standard	::	EN 50091-1		

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

TECHNICAL SPECIFICATIONS & 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 \pm 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 \pm 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 800W		
8.	Output Frequency	::	50 Hz \pm 4%(Synchronous to mains) 50 Hz \pm 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 40°C		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 45 dB		
16.	Conformance to Standards	::			
(i)	EMC Standards	::	IEC 801-2,3,4,5		
(ii)	Emission Standard	::	EN55022 Class B		
(iii)	Safety Standard	::	EN 50091-1		

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:
Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
- c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL SPECIFICATIONS & 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 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 \pm 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 \pm 1%		
6.	Transient Voltage Regulation at Step Load	::	< 5%		
7.	Maximum deliverable continuous Output Power	::	> 1600W		
8.	Output Frequency	::	50 Hz \pm 4%(Synchronous to mains) 50 Hz \pm 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 40°C		
(ii)	Humidity	::	upto 95% Rh		
15.	Noise level (at 1 meter)	::	< 45 dB		
16.	Conformance to Standards	::			
(i)	EMC Standards	::	IEC 801-2,3,4,5		
(ii)	Emission Standard	::	EN55022 Class B		
(iii)	Safety Standard	::	EN 50091-1		

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:
Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
- c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL SPECIFICATIONS & 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 \pm 5%				
4.	Total Energy storage capacity of Battery (in one string) @ F.L and @ Non-A/C environment	::	Backup time	Watt Hr. Required			
				96 V Bus	192 V Bus		
			For 30 Min	> 2880 Watt Hr	> 2880 Watt Hr		
	For 60 Min	> 6240 Watt Hr	> 4608 Watt Hr				
5.	AC Output Voltage and steady state Regulation @ F.L	::	230V AC; better than \pm 1%				
6.	Transient Voltage Regulation at Step Load	::	< 5%				
7.	Maximum deliverable continuous Output Power	::	> 2400W				
8.	Output Frequency	::	50 Hz \pm 4%(Synchronous to mains) 50 Hz \pm 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 40°C				
(ii)	Humidity	::	upto 95% Rh				
15.	Noise level (at 1 meter)	::	< 45 dB				
16.	Conformance to Standards	::					
(i)	EMC Standards	::	IEC 801-2,3,4,5				
(ii)	Emission Standard	::	EN55022 Class B				
(iii)	Safety Standard	::	EN 50091-1				

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:
Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
- c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL SPECIFICATIONS & 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 \pm 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 \pm 1%			
6.	Transient Voltage Regulation at Step Load	::	< 5%			
7.	Maximum deliverable continuous Output Power	::	> 4000W			
8.	Output Frequency	::	50 Hz \pm 4%(Synchronous to mains) 50 Hz \pm 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 40°C			
(ii)	Humidity	::	upto 95% Rh			
15.	Noise level (at 1 meter)	::	< 45 dB			
16.	Conformance to Standards	::				
(i)	EMC Standards	::	IEC 801-2,3,4,5			
(ii)	Emission Standard	::	EN55022 Class B			
(iii)	Safety Standard	::	EN 50091-1			

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:
Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
- c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL SPECIFICATIONS & 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 \pm 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 \pm 1%			
6.	Transient Voltage Regulation at Step Load	::	< 5%			
7.	Maximum deliverable continuous Output Power	::	> 8000W			
8.	Output Frequency	::	50 Hz \pm 4%(Synchronous to mains) 50 Hz \pm 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 40°C			
(ii)	Humidity	::	upto 95% Rh			
15.	Noise level (at 1 meter)	::	< 45 dB			
16.	Conformance to Standards	::				
(i)	EMC Standards	::	IEC 801-2,3,4,5			
(ii)	Emission Standard	::	EN55022 Class B			
(iii)	Safety Standard	::	EN 50091-1			

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:
Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
- c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL SPECIFICATIONS & BID

10kVA UPS True On Line, Sine wave Output (1 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	::	180V-270V AC			
2.	Input Power Factor @ F.L	::	> 0.95			
3.	Input Frequency Variation	::	50 Hz \pm 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 \pm 1%			
6.	Transient Voltage Regulation at Step Load	::	< 5%			
7.	Maximum deliverable continuous Output Power	::	> 8000W			
8.	Output Frequency	::	50 Hz \pm 4%(Synchronous to mains) 50 Hz \pm 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 40°C			
(ii)	Humidity	::	upto 95% Rh			
15.	Noise level (at 1 meter)	::	< 45 dB			
16.	Conformance to Standards	::				
(i)	EMC Standards	::	IEC 801-2,3,4,5			
(ii)	Emission Standard	::	EN55022 Class B			
(iii)	Safety Standard	::	EN 50091-1			

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:
Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
- c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL SPECIFICATIONS & 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 40°C			
(ii)	Humidity	::	upto 95% Rh			
15.	Noise level (at 1 meter)	::	< 45 dB			
16.	Conformance to Standards	::				
(i)	EMC Standards	::	IEC 801-2,3,4,5			
(ii)	Emission Standard	::	EN55022 Class B			
(iii)	Safety Standard	::	EN 50091-1			

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:
Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
- c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL SPECIFICATIONS & BID

15kVA UPS True On Line, Sine wave Output (3 ϕ i/p & 3 ϕ 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 \pm 15%			
2.	Input Power Factor @ F.L	::	> 0.93			
3.	Input Frequency Variation	::	50 Hz \pm 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 \pm 4%(Synchronous to mains) 50 Hz \pm 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 40°C			
(ii)	Humidity	::	upto 95% Rh			
15.	Noise level (at 1 meter)	::	< 45 dB			
16.	Conformance to Standards	::				
(i)	EMC Standards	::	IEC 801-2,3,4,5			
(ii)	Emission Standard	::	EN55022 Class B			
(iii)	Safety Standard	::	EN 50091-1			

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:
Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
- c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL SPECIFICATIONS & 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 40°C			
(ii)	Humidity	::	upto 95% Rh			
15.	Noise level (at 1 meter)	::	< 45 dB			
16.	Conformance to Standards	::				
(i)	EMC Standards	::	IEC 801-2,3,4,5			
(ii)	Emission Standard	::	EN55022 Class B			
(iii)	Safety Standard	::	EN 50091-1			

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:
Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
- c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL SPECIFICATIONS & 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 40°C			
(ii)	Humidity	::	upto 95% Rh			
15.	Noise level (at 1 meter)	::	< 45 dB			
16.	Conformance to Standards	::				
(i)	EMC Standards	::	IEC 801-2,3,4,5			
(ii)	Emission Standard	::	EN55022 Class B			
(iii)	Safety Standard	::	EN 50091-1			

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:
Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
- c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL SPECIFICATIONS & 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 40°C			
(ii)	Humidity	::	upto 95% Rh			
15.	Noise level (at 1 meter)	::	< 45 dB			
16.	Conformance to Standards	::				
(i)	EMC Standards	::	IEC 801-2,3,4,5			
(ii)	Emission Standard	::	EN55022 Class B			
(iii)	Safety Standard	::	EN 50091-1			

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:
Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
- c) Quote should indicate the Model/Series Name and Model Number of UPS

TECHNICAL SPECIFICATIONS & 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 40°C			
(ii)	Humidity	::	upto 95% Rh			
15.	Noise level (at 1 meter)	::	< 45 dB			
16.	Conformance to Standards	::				
(i)	EMC Standards	::	IEC 801-2,3,4,5			
(ii)	Emission Standard	::	EN55022 Class B			
(iii)	Safety Standard	::	EN 50091-1			

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:
Exide, Quanta (Amaron), Hitachi, Panasonic, Global Yuasa, Yuasa, Base or Rocket.
- c) Quote should indicate the Model/Series Name and Model Number of UPS

SCHEDULE

Name of Organization	Indian Institute of Technology Madras
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
Source of Fund (Institute/Project)	IIT Madras
Is Multi Currency Allowed	NO
Date of Issue/Publishing	10.11.2017
Document Download/Sale Start Date	10.11.2017
Document Download/Sale End Date	20.11.2017
Date for Pre-Bid Conference	Not applicable
Venue of Pre-Bid Conference	Not applicable
Last Date and Time for Uploading of Bids	20.11.2017 before 2.00 p.m
Date and Time of Opening of Technical Bid	21.11.2017 at 3.00 p.m
EMD	Rs. 10,000/-
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
Address for original EMD Submission	The Registrar Indian Institute of Technology Madras Chennai – 600 036
Contact No.	For Queries : 044- 2257 4947 / 2257 8288/8287
Email Address	jeevandoss@iitm.ac.in adstores@iitm.ac.in

ANNEXURE - B

Tender No. IITM/SPS /RC/UPS/Tech Enq./008/2017-18/SPL

“UPS System with Batteries (Rating from 1 kVA to 30 kVA)”

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		

ANNEXURE - C

Tender No. IITM/SPS /RC/UPS/Tech Enq./008/2017-18/SPL - “UPS System with Batteries (Rating from 1 kVA to 30 kVA)”

PRICE BID

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

Sl. No.	Description	Unit Price With external isolation transformer	Tax	Installation charges	Tax	Total cost	Unit price with built-in isolation transformer	Tax	Installation charges	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										

Sl. No.	Description	Unit Price With external isolation transformer	Tax	Installation charges	Tax	Total cost	Unit price with built-in isolation transformer	Tax	Installation charges	Tax	Total cost
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										