हिंदुस्तान ऑर्गेनिक केमिकल्स लिमिटेडHINDUSTAN ORGANIC CHEMICALS LTD
(भारत सरकार का उद्यम A Government of India Enterprise)
अंबलमुगल,कोची AMBALAMUGAL, ERNAKULAM – 682 302
दूरभाषPhone: (0484) 2720911, फ़ैक्सFAX No. (0484) 2720893

OPEN E- TENDER NOTICE

HOCL Invites open e Bids under two bid system for the supply of following item.

Item description: 2x15KVA, 110V, 50Hz UPS SYSTEM
एचओसीएल निविदा संदर्भ सं: HOCL Tender Ref No: MAT/PUR/21941/20

निविदा दस्तावेज़ www.hoclindia.comया www.eprocure.gov.inसे डाउनलोड कर सकता है।
Tender documents may be downloaded from www.hoclindia.comor www.eprocure.gov.in

अनुमोदित विक्रेता निविदा में भाग लेने के लिए एनआईसी ई प्रोक्योरमेंट पोर्टल (यूआरएल :https:/eprocure.gov.in/eprocure/app)में पंजीकृत करें। निर्धारित ऑनलाइन प्रक्रिया से भिन्न अन्य माध्यम से प्रस्तुत निविदाएँ स्वीकार नहीं किया जाएगा। कृपया अपना प्रस्ताव प्रस्तुत करने से पहले किसी जोड़/शुद्धिपत्र/विस्तार के लिए उपरोक्त वेबसाइट नियमित रूप से देखें।
Approved vendors may please get registered with NIC e-procurement portal (URL: https:/eprocure.gov.in/eprocure/app) to participate in the tender. Tenders submitted other than through online procedure specified will not be accepted. Please visit the above sites regularly for any addendum/ corrigendum/extension before submitting the offers.

धन्यवाद Thanking you,
भवदीय Yours Faithfully,

कृते हिंदुस्तान ऑर्गेनिक केमिकल्स लिमिटेड
For Hindustan Organic Chemicals Limited
(GSTIN: 32AAACH2663P1ZG)

K.R. Usharani के.आर .उषाराणी
CGM (Materials) मुख्यमहाप्रबंधक (सामग्री)

HINDUSTAN ORGANIC CHEMICALS LTD
(A Government of India Enterprise)
AMBALAMUGAL, COCHIN – 682 032
Phone: (0484) 2720911, FAX No. (0484) 2720893

MAT/PUR/21941/20 01.10.2020

Dear Sir,

Hindustan Organic Chemicals Ltd. is a Govt. of India Undertaking manufacturing Phenol, Acetone & Hydrogen Peroxide at its plant at Kochi, Kerala, India. HOCL invites open e tenders **for 2x15KVA,110VAC,50Hz UPS SYSTEM.**

Tender documents are uploaded in HOCL website www.hoclindia.com and www.eprocure.gov.in

The details of the tender are as shown in **INDEX** enclosed

You may submit your offer online before the due date and time specified
Earnest Money Deposit (EMD): Rs.14,500/-
Closing Date of Tender : 22.10.2020 at 2.00 pm
Opening Date of Tender : 23.10.2020 at 2.00 pm

Thanking you,

Yours faithfully,
For Hindustan Organic Chemicals Ltd.

USHARANI K.R
CGM (MATERIALS)

INDEX - TENDER NOTICE FOR 2x15KVA,110VAC,50Hz UPS SYSTEM

Annexure-I

Instructions for Online Submission

The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

Information useful for submitting online bids on the CPP Portal may be obtained at: https://eprocure.gov.in/eprocure/app**.**

REGISTRATION

1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: https://eprocure.gov.in/eprocure/app) by clicking on the link "**Online bidder Enrollment**" on the CPP Portal which is free of charge.

2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.

3) 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.

4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra etc.), with their profile.

5) 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 DSC's to others which may lead to misuse.

6) Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.

SEARCHING FOR TENDER DOCUMENTS

1) 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.

2) 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 Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.

3) 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.

PREPARATION OF BIDS

1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.

2) 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.

3) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.

4) 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, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" or ''Other Important Documents" area available to them to upload such documents. These documents may be directly submitted from the "My Space" 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.

Note: *My Documents space is only a repository given to the Bidders to ease the uploading process. If Bidder has uploaded his Documents in My Documents space, this does not automatically ensure these Documents being part of Technical Bid.*

SUBMISSION OF BIDS

1) Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.

2) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.

3) Bidder has to select the payment option as "offline" to pay the tender fee / EMD as applicable and enter details of the instrument.

4) Bidder should prepare the EMD as per the instructions specified in the tender document. The original should be posted/couriered/given in person to the concerned official, latest by the last date of bid submission or as specified in the tender documents. The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.

5) Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.

6) 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.

7) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.

7) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

8) Upon the successful and timely submission of bids (i.e. after Clicking "Freeze Bid Submission" in the portal), 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.

9) The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

ASSISTANCE TO BIDDERS

1) 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.

2) 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.

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ANNEXURE II

Eligibility criteria for participating in the bid.

Offers of bidders who satisfy the following Eligibility Criteria only will be considered .

(1) Vendor should have adequate technical and commercial capability to supply the materials as per HOCL requirements.
(2) Vendor must have executed orders of minimum Rs.58 lakhs of contracts for similar items in the last three years.
(3) Vendor should have executed at least one order of Rs 14.50 lakhs of similar items in the last three years.
(4) Vendor should submit solvency certificate from a scheduled bank for a minimum value of Rs.7.25 lakhs.

Vendor should provide documentary evidences for all the above along with the Technical Bid.

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ANNEXURE III

GENERAL TERMS AND CONDITIONS FOR E BID SUBMISSION

Please submit your e-bids conforming to the specifications and the terms and conditions attached as per instructions given below:-

1. HOCL has entered into an Agreement with NIC for e procurement through their portal www.eprocure.gov.in. Quotations shall be submitted online on or before the due date and time of closing the tender.
2. Bids shall be opened electronically on specified date and time given in NIT.
3. **EARNEST MONEY DEPOSIT (EMD) :** A refundable **EMD of Rs. 14,500/-** to be submitted along with the technical bid. EMD may be submitted in the form of Bank transfer through our banker M/s State Bank Of India, Ambalamedu Branch, A/c No: 52092955208; IFS Code:SBIN0001108. Details of bank transfer should be indicated in your technical offer. EMD may also be submitted by way of Bank Guarantee from any scheduled banks. EMD of the successful tender may be adjusted against the security Deposit payable. EMD of unsuccessful bidder will be returned after finalization of the tender. EMD of a tenderer shall be forfeited if he withdraws or amends his tender or impairs or derogates from the tender in any respect within the validity period of the tender.
4. **PERFORMANCE BANK GUARANTEE:** Performance bank guarantee for 5% of order value to be submitted within 21 days of order placement. The same shall be valid for a period of one year from the date of successful commissioning of the item.
5. PSUs and Vendors registered with SSI/MSME/NSIC need not submit EMD, but have to submit valid SSI/MSME/NSIC/UAM registration/exemption certificate along with the Techno-commercial bid.
6. BOQ: Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable .If the price bid has been given as a standard BOQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BOQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder).No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BOQ file is found to be modified by the bidder, the bid will be rejected.
7. QUANTITY: As per BOQ
8. Test certificates & Warranty Certificates to be provided along with supply.
9. The bid shall contain as integral part of the same the following compliance statement: "We have read, understood and accepted the terms and conditions of purchase and related documents forming part of this enquiry and agree to supply the goods in compliance with the same."
10. Bidders should carefully study the documents of this enquiry. All terms and conditions set out there in the enquiry shall be binding on the bidders unless conflicting with any terms and conditions expressly stated by HOCL while accepting any bid, in the event of such acceptance.
11. HOCL reserves the right, without assigning any reason whatsoever, to accept or reject any or all bids in part or in full or cancel this enquiry.
12. HOCL reserves the right to extend without giving any reason(s) the closing date/time of the enquiry.

13. Bids shall be valid for a minimum of 60 days from the due date for receipt and opening of the bids.
14. Specification of the Product: Specifications offered product shall be uploaded along with Bid.
15. Payment terms shall be: a) 30 days credit or b) 90% against dispatch documents through bank and balance within 30 days of receipt and acceptance of materials at HOCL site. In the latter case or any other terms offered, suitable bank charges shall be loaded for price comparison.
16. Delivery period must be clearly mentioned in your offer in the absence of which offer will be treated as on "Ex-stock basis". In case of delayed delivery a penalty of ½% of the price of the goods on arrears per week subject to a maximum of 5% will be levied.
17. Bids shall be submitted online. Tenders submitted other than through online procedure specified will not be accepted. Tenders should be free from overwriting or erasing. Corrections and additions, if any must be attested.

18. As far as possible the rate should be quoted on FOR Destination basis.
    In case a tenderer does not specify the basis of price or quotes on Ex-works or FOR dispatching station basis, price will be loaded on the following manner.

    a. In case of Ex-works offer and if the firm does not specify the packing & Forwarding Charge, 2% of Ex-Works price will be loaded to arrive at FOR dispatching station price.
    b. In case of FOR Dispatching station offer, following percentage will be added to arrive FOR destination price as element of estimated freight up to destination.

Approximate distance of dispatching station from site	**% for dispatching station price**
Above 2001 Km	5%
1501-2000 Km	4%
1001-1500 Km	3%
501-1000 Km	2%
500 Km & below	1%

    In case the firm quotes the exact amount of freight & P&F Charges, the same will be added in place of above percentage amount
    The rate should always be indicated for the unit mentioned in the tender.
19. Prices shall be considered to be firm once the order is placed. If supply is not effected in time, risk purchase shall be carried out at the cost of the tenderer. Tenderer is also liable to be blacklisted in case of default.

20. Tenderer should agree for inspection of material at their site, if desired by HOCL. The inspection may be carried out by the representative of HOCL or by a third party or jointly.

21. The Tenderer must specify their GSTIN No& HSN code of material offered in the BID.

22. The successful tenderer shall, if so desired by HOCL, deposit an amount equivalent to 5% of the value of order as security deposit within 10 days of the order towards satisfactory execution of the order. No interest will be paid on this amount by HOCL.

23. Supplier must extend the benefits to HOCL if there is any subsequent fall in price or if the same materials are offered to any other customer at lower price.

24. HOCL reserves the right to split the order between two or more suppliers and or reject any or all tenders without assigning any reason.

25. Transit Insurance will be arranged by HOCL.

26. Delivery will be as per delivery schedule given by HOCL.

27. Manufacturers routine test certificates in original or attested, warranty certificates in original, drawings in original etc. as applicable shall be provided along with the supply.

28. Tenderer may attach necessary catalogues/drawings/detailed specifications of the items wherever required. Also clearly specify the make/model of the item offered.

29. Purchase preferences, EMD/SD Exemption etc for PSUs/SSI units etc will be applicable as per GOI directives from time to time. For this, the tenderer should claim their eligibility along with the supporting documents in their offer itself.

30. Quotations meeting our delivery terms, if any specified, will only be considered.

31. If the tenderer is deviating from any of the above terms mentioned, your offer is liable to be rejected.

32. Opening date of tender is 23.10.2020 at 2.00 pm

33. Material is required urgently. hence vendors may please quote their minimum delivery period

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ANNEXURE- IV-A

COMMERCIAL TERM FORMAT *(To be printed on your letter head& uploaded)*	
(Please fill up the details mentioned below in your letter head and upload along with your bid)	
Name and Address of Organization	
Phone & Fax No	
GSTIN	
E-mail id for correspondence	
Contact Person Name and Mobile No.	
MSME/NSIC registration details: pl. enclose documentary proof	
Whether BIS certified (If yes, enclose copy of BIS Certification)	Yes/No
Payment Term offered.	
Validity of offer	
Taxes Applicable	
Deviation in specification if any	
I/We here by confirm that, I/We have not been blacklisted in the past by any Public Sector Undertakings/ Government organizations. Signature and Stamp	

ANNEXURE IV-B

(KINDLY FILL THIS SHEET AND SUBMIT IN -COMMERCIAL/TECHNICAL BID)

Name of Bidder: ……..		
Sr. No.	**Commercial Clauses**	**Bidder Confirmation (Please put √ in front of your confirmation)**
1	Whether bidder (a proprietary concern, Partnership Firm, Company) is currently on holiday list/black list/de-listed or has been put on holiday/blacklisted/de-listed at any PSU/govt. Organization. If so, give details.	□ Yes, We are on holiday List/Black List/De-List □ No
2i	Whether the party is registered under Micro/Small/Medium Enterprises act 2006 (Please furnish the proof)	□ Micro□ Medium □ Small□ No
2-ii	Status of MSE Bidder	□ Manufacturer □ Services □ Not Applicable
2-iii	Whether MSE bidder is offering product manufactured by him/her	□ Yes □ No
3i	All MSE bidders shall register / declare their UAM Number on CPP Portal and copy of this registration / declaration shall be attached with the offer; failing which such bidders will not be able to enjoy benefits as per PP Policy for MSME order, 2012. SSI/MSME/NSIC/UAM /DIC registration certificate	□ Mention UAM Number …….. □ Not Applicable
3-ii	Submitted valid document against clause no 3i	□ Submitted □ Not Applicable
4i	Whether the proprietor of "MSME" enterprise is from SC/ST category (Please attach caste certificate issued by competent authority)	□ Yes □ No
4ii	Whether the proprietor of "MSME" enterprise is woman (i.e. Woman proprietorship, or holding minimum 51% shares in case of Partnership/Private Limited Companies)	□ Yes □ No
4iil	Submitted certificate against clause no 4ii	□ Submitted □ Not Applicable
5	AGREED TO ALL TERMS AND CONDITIONS OF ENQUIRY: It is hereby stated that the quotation/offer submitted is in full compliance with the documents issued against the enquiry and also further confirmed that there is no deviation from all the terms and conditions as per the enquiry. Non-acceptance or deviation to HOCL's standard terms and conditions mentioned in enquiry documents may lead to rejection of offer, no correspondence shall be done for clarifications	□ Agreed □ Not Agreed
DATE:SIGN AND STAMP OF BIDDER		

ANNEXURE-V

(For Purchase Order/ Work Order with estimated value more thanFIVE Lakhs) FORM-F

ANNEXURE TO BE SUBMITTED ALONG WITH THE BID AGAINST TENDER NO_____

(KINDLY FILL AND SUBMIT ALONG WITH COMMERCIAL/TECHNICAL BID)

NAME OF BIDDER: ……..

Sr.No.	COMMERCIAL CLAUSES	BIDDER CONFIRMATION (PLEASE PUT √)
1	Please mention whether you are a Class-I/Class II Local supplier.(Please see the definition given below)	Class I Class II
2	Specify thepercentage (%) of local content.	_____ %
3	Details of location at which the local value addition is made.	
4	Mention whether the product offered is manufactured in India under a license from a foreign manufacturer who hold intellectual property rights and there is a technology collaboration agreement / Transfer of technology agreement	Yes / No

SELF DECLARATION OF LOCAL CONTENT

We hereby declare that the percentage(%) of local content specified against mentioned against Sr.No.2 is _____%. We also understand that submitting False self-declarations and auditors will be in breach of Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a Bidder or its successors can be debarred for up to Two Years as per the Rule 151 (iii) of the General. Financial Rules along with such other actions as may be permissible under Law.

Definitions

Local Content: - The amount of value added in India(Total value of item procured minus the value of imported content in the item(including all customs duties) as a proportion of total value, in percentage.

Class I Local Supplier: - Supplier or service provider whose goods,services or works offered for procurement has local content equal to or more than 50%.

Class II Local Supplier: - Supplier or service provider whose goods,services or works offered for procurement has local content more than 20% but less than 50 %.

Purchase Preference: -Will be as per the applicable Government order.

DATE SIGNATURE AND STAMP

Scope of work for Supply, Installation, Testing & commissioning of 2X15 KVA Industrial Parallel Redundant UPS System at HOCL, Ambalamugal.

	SCOPE OF WORK	
Sl.No.	**Description**	**Required**
1.0	Design, manufacture, testing at factory, supply, erection and commissioning at site of 110V AC, 50 Hz, 2X15 KVA parallel redundant UPS system as per enclosed data sheets and complete with all accessories like	√
1.1	Rectifier cum chargers	√
1.2	Input rectifier transformer	√
1.3	IGBT inverters	√
1.4	Inverter transformers	√
1.5	Battery circuit breaker inside the panel	√
1.6	Static and manual bypass switches	√
1.7	Servo voltage regulator (Dry type)	√
1.8	3 ph to single phase bypass line transformers	√
1.9	Reserve supply arrangement & cooling arrangement	√
1.10	Interconnecting cables, cabling, cable glands, lugs & Cable between UPS1&2 system and SCVS	√
1.11	Metering, protection and annunciation	√
1.12	Duplicate earthing terminals on each panel	√
2	Vendor shall supply GA drawings, Schematic diagrams, Battery sizing calculation, catalog of parts, wiring diagrams, bill of materials, operation and maintenance manual, test certificates along with supply of UPS.	√
3	All the required Inspection and test shall be conducted as per IEC 62040 part 3 and records shall be submitted. Vendor shall submit their inspection and test plan and check list forms for our review up on confirming the purchase order. In addition, following factory acceptance tests shall be conducted in presence of HOCL representative.	√

	a) Insulation Resistance test b) Line regulation and input power factor test c) Rectifier and charger tests d) Output test e) Interconnection cable check f) Total harmonic distortion g) Light Load test h) UPS auxiliary device test i) Simulation of parallel redundant UPS fault test j) Current division in parallel UPS k) UPS performance tests for output overload, dynamic response, transfer, re-transfer, Manual bypass, AC input failure and return, load regulation, heat run test, indication& alarm and Overall efficiency test. l) Charging and discharging test of batteries at site.	
4	Comprehensive Annual maintenance contract for ten years after guarantee period including supply of all consumables/ spares but excluding battery.	√
5	Purchaser's scope is limited to the followings	
5.1	Supply of 3 phase and neutral 415 V + / -5% AC supply along with duplicate earthing leads at the incoming AC supply terminals of each 15 KVA UPS and reserve supply, including cabling	
5.2	Outgoing cables from UPS to ACDB and battery bank	
5.3	RS232/RS485 interphase Cable for remote annunciation and metering from UPS to MRS control room.	
5.4	Battery Isolator in sheet steel enclosure for isolating the battery bank.	
6	BUYBACK OF EXISTING UPS	
6.1	HOCL is having a 2x20 kVA parallel redundant DB make UPS which has been in service from 2007 and is still in working condition. Vendor shall take back the existing UPS systems, SCVS and batteries (239 nos, Ni-Cd, KPM155P) in as is where is condition including dismantling and handling at site.	√
6.2	Buy back rate of existing 239 Nos, Ni-Cd, KPM155P batteries, UPS 1&2 and SCVS shall be given separately and deducted from the new UPS rate while making the price bid.	√
6.3	Existing UPS 1&2, SCVs and batteries are to be disconnected, dismantled and shifted by the supplier	√
7	Installation of new UPS system at site	√

7.1	Vendor shall arrange for transportation, loading/unloading of all items at site and storage place, positioning of the UPS system and SCVS in the designated place. It is the responsibility of the vendor to supply all items, supervision that are incidental and necessary for completion of the work whether specifically mentioned or not.	√
7.2	The proposed UPS and SCVS have to be installed in the existing room in the available space. (Lay out of existing UPS installation attached). The proposed UPS is for Phenol Plant which is located at HOCL, Kochi Unit. UPS room is located at second floor of Phenol Plant control room building. There is an access door available in second floor south side which can be used for shifting the UPS panel and accessories. Crane assistance might require for lifting the UPS to second floor.	√

Data Sheet and Specification – 2x15KVA,110VAC,50 Hz Industrial UPS system

1.0	**UPS - GENERAL**	
1.1	UPS configuration	Parallel Redundant with static bypass
1.2	Output Voltage with regulation	110 VAC ± 2%
1.3	Output free running frequency with regulation	50 Hz ± 0.1Hz
1.4	No of phase / wires at output	Single Phase. 2 wire
1.5	Continuous output rating (KVA)	15 KVA at 0.8 pf lag
1.6	Battery Backup time	60 minutes (minimum)
1.7	No.of sets required	One (parallel redundant type)
1.8	No. of inverters required per set	Two
1.9	Location	Indoor
1.10	Ambient temperature	
	a. Maximum	45 ^{0} C
	b. Minimum	17 ^{0} C
1.11	Load power factor range	0.6 (lag) to unity
1.12	UPS neutral	Floating Neutral UPS output
1.13	Load details	Loads are likely to produce high Harmonics (with crest factor 3: 1)
1.14	MTBF (Mean Time Between Failures) of UPS system	1,00,000 Hrs.
1.15	Efficiency at rated load	90% minimum
1.16	Reference standard	IEC 62040-Part 1,2 and 3.
2.0	**MAIN INPUT POWER SUPPLY**	
2.1	Voltage with regulation	415 V AC ±10%
2.2	Frequency with regulation	50 Hz ± 5 %
2.3	Phases / wires	3 phase/ 3 wire
2.4	Method of neutral earthing	Solidly earthed
2.5	Fault level current	≥ 25 KA
3.0	**RESERVE INPUT POWER SUPPLY**	
3.1	Voltage with regulation	415V AC ±10%
3.2	Frequency with regulation	50 Hz ± 5 %
3.3	Phases / wires	3 Phase / 3 wire
3.4	Method of neutral earthing	Solidly earthed
3.5	Fault level current	≥ 25 KA
4	**Rectifier section**	
4.1	Whether separate float and boost charges are required?	Combined Float and Boost charger

4.2	Special requirements if any ?	1. Ups shall be provided with one Parallel redundant unit with 2nos rectifier cum charger Units. 2. Rectifier shall be 12 Pulse configurations 3. Charger unit shall have current limiting capability incorporating reliable quick response and shall be provided with AC overload protection. 4. Soft start feature shall be incorporated in the rectifier control circuits to reduce the the inrush currents in supply line during power on. 5. Provision may be provided for smooth manual adjustment of boost charging current during boost charging operation and trickle charging current during floating operation.
5.0	**INVERTER SECTION**	
5.1	Semiconductor power control device	Insulated Gate Bipolar Transistor (IGBT)
5.2	Overload capacity	110% for 60 minutes,125% for 10 minutes, 150% % for 1 minute.
5.3	Special requirements if any?	Total harmonic distortion for linear loads shall be < 3 % and non- linear loads shall be < 5%
6.0	**STATIC SWITCH**	
6.1	Transfer facility	Manual and automatic with selector Switch
6.2	Retransfer facility	Manual and Automatic
6.3	Special requirements if any?	1.0 For static switch, the following protections shall be provided. a. Fast acting semiconductor fuses b. Snubber circuit protection for each device c. Short circuit protection for power and control circuit with fuses. 2. Maximum transfer time of UPS to bypass and Vice versa. 2.1 Auto a. Synchronized mode. Less than 5 milli second with no break. b. Asynchronized mode: less than 20 milli second with break 2.2 Manual Mode a. Synchronized mode less than 5 milli second. b. Asynchronized mode: Inhibited. 3 A toggle switch shall be provided for running the UPS in synchronized or Asynchronized mode.

		4 A manual retransfer switch shall be provided for transferring the load from reserve supply to inverter.
7.0	**RESERVE SUPPLY ARRANGEMENT**	
7.1	Input AC supply	Vide 3.0 above
7.2	Special requirements if any?	1. Voltage regulation for servo stabilizer shall be with in ± 2%. 2.For stand by supply Servo controlled stabilizer shall be provided.
8.0	**COOLING ARRANGEMENT**	By means of cooling fan.
8.1	Special requirements if any?	Redundant cooling fan required.
9.0	**DISTRIBUTION BOARD**	**HOCL Scope**
9.1	Existing ACDB to be utilized	HOCL scope.
10.0	**PARALLEL OPERATION**	
10.1	Whether envisaged at present?	Yes
10.2	No.of inverter units per set	Two
11.0	**PROTECTIONS**	
11.1	Special requirements if any	MCCBs shall be provided for input, output, battery and reserve supply units. Battery bank shall have earth leakage protection also.
12.0	**INDICATIONS & METERS**	
12.1	Parameters on Local Display unit	
	Frequency	Inverter and SCVS.
	Voltage and Current (Vendor may provide digital/ microprocessor Based indication and metering as per Manufacturers standard)	Main Supply
		Reserve supply
		Battery
		Inverter
		Load
12.2	Faults on local display unit (Visual and audio annunciation shall be Provided as per manufacturer's Standard)	Necessary annunciations including the following but not limited to them shall be provided for mains and reserve supply wherever applicable with accept reset and test facilities.
		Mains over/ under voltage
		Input Abnormal/Phase failure
		Battery low pre Alarm
		Battery low trip
		Battery overvoltage
		Battery Status
		Inverter over voltage
		Inverter under voltage
		Inverter overload
		Overtemperature

		Manual bypass switch ON
		Reserve supply over/under voltage
		Reserve supply frequency abnormal
12.3	Remote Annunciator/Indicator	Remote Annunciator or LCD indicator with RS232/RS485 interface required at MRS, nearly 500 meters away from UPS Room. Remote LCD indicators are required for both UPS1& 2. Remote LCD indicator shall read Parameters such as Main voltage, DC voltage, Output voltage, Battery voltage, Battery current, UPS load, Main frequency etc. Existing available cable laid between UPS and MRS can be used for the interface.
		Remote LCD indicators shall be provided with following alarm annunciations with Test, Acknowledge and Reset facility. Alarms: Output overload, Mains fail, Load on Bypass, Load on Battery, Battery Low, Inverter trip, Rectifier Trip, Fault etc.
12.4	Potential Free contacts	Required for remote audio, visual Annunciation of following alarm/trip signals Common Alarm, Reserve frequency out of Range, Load on reserve supply, Inverter overload, Low battery etc.
13.0	**PANELS**	
13.1	Location	Indoor
13.2	Panel enclosure	2mm thick CRCA steel sheet.
13.3	Degree of protection	IP 41 or Above
13.4	Paint and final color	Epoxy powder coated with color RAL 7032/7035 finish.
13.5	Whether Anti-Condensation Heater required?	Yes
14.0	**BATTERY**	
14.1	Battery shall be HBL make Ni-Cd, NCPP series, Single cell, KPM type. Battery bank shall be common for both UPS 1 and 2. It shall able to provide a backup of minimum one hour. The battery shall be complete with inter-cell, inter-row, inter-tier connections. The battery shall be complete with all accessories and mounting arrangements. Battery intercell connectors shall be properly shrouded. Battery stand shall be given proper anticorrosive treatment. If battery stand is made of M.S, painting system shall be alkali resistant epoxy powder coated. Battery stand shall be provided with proper size rack insulators on all resting legs. Battery casing shall be marked for minimum and maximum level of electrolyte. Individual cells shall be numbered from 'digit 1 to last cell no digit'. There will be a terminal strip provided in the battery stand for taking the battery connections to Battery Isolator. All the hardware used for battery bank connections shall be SS316 series. The height of battery stands selected shall be in such a way that it will ease the routine maintenance of individual cells.	

14.2	For battery sizing calculation, design margin may be considered as 1 and aging factor may be taken as 1.2. Minimum battery operating temperature can be taken as 17 degc. Selection of temp. derating factor shall be derived based on the above temperature. State of charge factor shall be suitably taken based on the above given battery. Battery sizing calculation shall be as per IEEE 1115-2014.	
14.3	Earth Leakage Protection for battery shall be provided.	
15.0	INSTALLATION, TESTING & COMMISSIONING	Required

16.0.0 GENERAL REQUIREMENTS

16.1 The equipment shall be designed for input voltage, output voltage, frequency, output capacity and energy storage capacity as specified in the data sheet. The data sheet will also specify special operating conditions and maximum ambient temperature in which the equipment must operate.

16.2 The equipment shall be designed to furnish an un interruptible automatic, self-regulated source of alternating current power to critical loads described in the data sheet.

16.3 The system shall be designed for the following mode of operations.

16.3.1 During normal mode a source of alternating current power will supply energy to the system. The rectifier section shall receive power from supply lines and rectify the power and furnish energy to the inverter and also to the storage battery at required voltage. The inverter section shall receive the output of the rectifier section and generate alternating current in the form of sine wave with low harmonic content. UPS 1 and 2 shall share the load evenly in normal operating situations.

16.3.2 The UPS 1 and 2 shall communicate with each other to create an output voltage that is completely synchronized. When one of the UPS is removed from parallel bus for service (or if it were to remove itself due to an internal failure) the other UPS is required to immediately accept the load of the failed UPS module. This capability allows any one UPS to be removed from the bus and be repaired without requiring the load to be connected to reserve supply.

16.4 The UPS is intended for equipment those are very critical by way that shut down of these equipment results in heavy financial losses apart from the safety aspects of personal and equipment. Hence the UPS supplied shall maintain very high standards with respect to reliability and quality of power output. (If required the vendor can study the present UPS systems at site).

17.0 Rectifier

17.1 The UPS shall be provided with two independent identical rectifiers each with one AC input and one DC output. Normally the rectifiers shall operate in parallel and share the battery and UPS load between them equally. Each rectifier units shall be independently capable of charging the battery at the maximum allowable charging rate of the battery and simultaneously feed the UPS loads through inverters. Necessary protection and isolation shall be provided to isolate the faulty rectifier without affecting the operation of the healthy unit. If any one of the rectifiers fails, the

UPS load shall not be shifted to battery instead load shall be shared by the other healthy UPS and healthy rectifier shall charge the battery. If both rectifiers develop faults the UPS load shall be fed automatically from the battery without interruption. It shall also be possible to remove one rectifier for repairs without interrupting the DC supply to the inverters.

17.2 The changeover between float and boost modes in parallel and independent operations shall not result in any malfunction of rectifiers.

17.3 The rectifiers shall be provided with automatic voltage regulation to limit rectifier output voltage within safe values under all conditions of battery charging.

17.4 The mains transformer shall be double wound vacuum impregnated and dry type.

17.5 The float and boost chargers shall be suitable for charging the battery at the maximum charging current allowable while the charger is supplying the continuous load specified in the data sheet for the ups. The boost charger shall be capable of charging completely discharged condition in about 8-hour duration.

17.6 Unless otherwise specified in the data sheet the voltage regulation at rectifier output bus shall be within ± 2% of the float / boost voltage applicable for the specified mains voltage and frequency variations.

18.0 Inverter

18.1 The UPS shall be provided with two independent identical inverters each with DC input and AC output. Normally the inverters shall operate in parallel and share the UPS loads equally.

18.2 The inverter shall have synchronous mode and asynchronous mode of operations with selector switch. In the asynchronous mode the inverter frequency shall operate at the free running frequency with regulations as specified in the data sheet. In the synchronous mode the inverter frequency shall follow the reserve supply frequency as long as the latter is within ± 2.5 Hz of the free running frequency for enabling synchronized transfer of load between inverter and reserve supply. When reserve supply frequency exceeds the above limits the inverter shall delink from the mains frequency and shall operate at the free running frequency and will return back to synchronous mode once the frequencies are within the above limits. The frequency changes shall take place smoothly without any break in supply or transients. Facility for manual adjustment of free running frequency with in ± 5% (adjustable from ± 1% to ±5%) of specified value shall be provided.

18.3 Each inverter shall be rated for carrying the rated UPS load with over rating as specified independently. When a disturbance / fault occurs in any of the inverter the faulty unit shall automatically be separated out and the entire load shall be fed from the other inverter. If both the inverters develop fault the complete load shall be transferred to reserve supply arrangement through static switch. For ease of maintenance it shall be possible to isolate any one of the inverters without affecting operation of the other unit. Redundancy shall be provided for the output transformer in the inverter section.

18.4 Each inverter shall have its own oscillator to govern the output frequency.

18.5 During parallel operation of inverters, possibility of circulating current shall be prevented by providing suitable circuitry / control scheme.

18.6 When both the inverters share the load, the inverters shall operate normally at the free running frequency. If one unit becomes faulty the healthy unit shall synchronize with reserve supply frequency, if the frequency is within the permissible range. The inverter frequency shall follow the reserve supply frequency as long as the latter is within a range of ± 5% (adjustable from 1 to ± 5%) of 50 Hz.

18.7 Suitable provision shall be made to avoid manual by pass operations if frequency is not synchronized. Manual by pass switch shall be double pole and static switch shall be single pole type.

18.8 The 110 V AC UPS shall be suitable for the crest factor of load 3:1. Maximum harmonic distortion in the output voltage wave form shall be limited to 5%.

18.9 The inverter voltage and frequency regulation shall be within the specified limits under the following conditions.

a) 0 % to 100% load variations
b) Ambient temperature variations as specified
c) Minimum to maximum DC bus voltage variation
d) Failure of cooling employed

For step load changes of magnitude 50% the voltage variation shall be within ± 10% and recovery shall be within 5 Cycles unless otherwise specified in the data sheet.

18.10 Regulation of the output voltage shall be within ± 2% of the rated voltage for the specified load power factor unless otherwise indicated in the data sheet. Facility to adjust the output voltage to compensate the line drop shall be provided if specified in the data sheet.

18.11 The output transformer shall be vacuum impregnated and dry type.

19.0 Static Switch

19.1The static switch shall consist of solid-state devices for automatic transfer of load from inverter to the reserve supply in the following cases.

a) Minimum and maximum voltage limits of the inverter exceeded.
b) On inverters failure
c) On inverter overload exceeding limits
d) On manual push button operation

19.2 The transfer/ retransfer between inverter and reserve supply shall take place with in ¼ cycle without interruption in supply and transient of the two supplies are synchronized

19.3 Suitable provisions shall be incorporated in the system to handle transfer / retransfer between asynchronized supplies without generation of transients.

19.4 Manual/ Automatic retransfer facility with selector switch shall be provided as specified in the data sheet.

19.5 Manual transfer and retransfer through static switch shall be by actuation of push button like device.

19.6 Possibility of hunting in the automatic mode of operation between inverter and reserve supply shall be prevented by suitable means. The thermal characteristics of the semiconductor devices shall be taken into consideration to prevent damage of these devices due to overheating during frequent transfer / retransfer on over load.

19.7 Manual by-pass switch / circuit breaker shall be provided to connect the reserve supply directly to the output bus, by passing the static switch. The manual bypass switch shall be make before break type and of adequate rating for operation on full output capacity of the UPS. Suitable arrangement shall be provided to prevent operation of this switch when supplies are not synchronized.

20. Reserve Supply Arrangement

20.1 The reserve supply arrangement shall consist of separate alternating current source transformer and static voltage stabilizer unless otherwise specified in the data sheet. The reserve supply at the output shall be of the same phase sequence and voltage as that of the inverter output.

20.2 The ratings of components in the reserve supply arrangement shall be adequate for handling the full rated capacity of the UPS.

20.3 The voltage regulation of the static voltage stabilizer supply shall be within ± 2% . When the input AC voltage variation is within ± 10% and frequency variation is within ± 5% . unless otherwise specified in the data sheet.

20.4 The static voltage stabilizer shall be fully solid state and shall be suitable for the load specified for the UPS.

20.5 The power transformer used on the input side of the reserve supply arrangement shall be double wound vacuum impregnated and dry type

21. Protection

21.1 Equipment components shall be selected to provide sufficient voltage capability & ample current carrying capacity to furnish a reasonable margin for handling over currents and voltage variations.

21.2 Transient suppressing circuits and high-speed fuses shall be used to protect the semiconductor devices. Suitable filters shall be provided at input and output ends of the UPS to suppress radio frequency interference.

21.3 All semiconductor circuits shall be fuse or breaker protected so as to prevent cascade or sequential semiconductor failures.

21.4 UPS shall have the necessary built in protections such as those against input over/under voltages phase failures over load output over/ under voltages battery over/under voltages surges induced by primary AC source surges at output due to load transfer short circuits and earth faults.

21.5 The UPS shall be designed for the fault level specified in the data sheet

21.6 The UPS shall be short circuit stable by ensuring safety of various components of the system during short circuits.

21.7 Breakers along with last acting solid-state protection circuits shall be used to fully isolate the faulty sections.

21.8 Air break switches / circuit breakers of adequate duty and number of poles shall be provided for fully isolating AC incomers, battery, rectifier, inverter and reserve supply static switch etc. for service and maintenance without the need of total shut down of the UPS.

22.0 Indications and Meters

22.1 Voltage, current and frequency meters as provided in the UPS configuration shall essentially be provided. Vendor may also provide other indications and meters as per manufactures standard.

22.2 Visual and audio annunciation shall be provided. Refer Cl.12 of data sheet also.

22.3 Potential free contacts shall be provided for remote audio-visual annunciation. Refer clause 12.4 of data sheet.

22.4 The UPS system shall have RS 232 and Rs 485 ports for compatibility for network connection.

23.0 Panels

23.1 The UPS 1, UPS 2, SCVS and all other accessories shall be accommodated in separate self-contained self-standing floor mounted damp and vermin proof sheet steel cubicles in folded construction with requirements as specified in the data shee The cubicles shall be of equal height and depth.

23.2 Cubicles shall have doors on concealed hinges with handle and locking facility. All doors and removable covers shall be gasketed all round with non-aging gasket.

23.3 All controls and indicating instruments shall be flush mounted on the front and shall be arranged so as to give a neat appearance. Labels shall be used for designating each component mounted on the panel.

23.4 All the components shall be mounted with ample clearance in between them for convenience of operation inspection and maintenance.

23.5 All internal wiring shall be done with insulated copper conductors of minimum size of 0.5 sq mm and shall be neatly laid out and clamped. Both ends of wires shall be provided with numbered ferrules for identification.

23.6 The power conductors shall be PVC insulated and of adequate size to carry the power currents.

23.7 The panels shall be complete with inter connecting cables, wires and necessary compression type cable glands and shall be ready to receive the incoming and outgoing cables.

23.8 Cable entry shall be from bottom with removable gland plates. Gland plates of UPS 1&2 and SCVS panels shall be provided with suitable gland holes for incomer cables 4Cx95 sq.mm, output cable 1Cx300 sq.mm(2nos) and SCVS interconnecting cables.

23.9 The live parts shall be shrouded to ensure safely to personnel when panel doors are opened for inspection.

23.10 Necessary name plates giving relevant particulars of the equipment shall be provided on individual equipment /component.

23.11 Duplicate earthing terminals and earth bus at the bottom shall be provided for each panel.

23.12 Ventilation louvers provided shall have dust filters

23.13 Panels shall be provided with internal panel lamps and plug outlets with ON-OFF switches

23.14 Necessary foundation bolts, nuts, washers etc. shall be supplied along with the panels

23.15 Facility for handling the equipment at site, such as lifting logs shall be provided.

23.16 The reserve supply equipment and static switch shall be housed in a separate panel.

23.17 Wiring of electrical components mounted on doors and movable covers shall be protected against mechanical damage by means of flexible type conduit.

23.18 Doors hinged frames etc. on which electrical components are mounted shall be electrically connected to the frame or the protective conductor by means of a copper braid having a cross section of at least 10 sq. mm.

24.0 Other Requirements

24 .1 The following protection shall be provided for rectifiers, inverters ,UPS system

a. RFI filters for rectifier input.
b. Fast acting semiconductor fuses for rectifier input, battery path and by pass.
c. Battery charger current limiting device
d. Snubber circuit for each device for dv/dt protection
e. Over temperature protection.
f. Fuses in the control circuit.

25.0 Annual Maintenance Contract (AMC)

The vendor has to quote separately in the schedule of rates / work for 10 years annual maintenance contract (AMC) charges in addition to the guarantee period which shall be minimum one year from date of commissioning. The 10 years AMC period will commence immediately after the completion of the guarantee period. Scope of comprehensive AMC will include deputing of technical personnel for quarterly servicing and maintenance of UPS with supply of required spares.

25.1 The vendor shall provide service facility to attend the complaints within 24 hours from the service call during the AMC period.

25.2 Any parts / components that may be found defective by the customer due to manufacturing defects faulty parts / components and workmanship within the guarantee / AMC period should be replaced or repaired immediately in good working condition free of cost by the vendor.

25.3 The vendor shall carry out regular preventive maintenance also during the guarantee / AMC period.

26.0 Guaranteed efficiency and Loss Capitalization

An efficiency test shall be conducted at manufactures works by connecting 3 inputs at the incomers of UPS and a load of 15KVA @0.8 pf at the UPS output. The input power shall be measured and if actual losses measured exceed the guaranteed losses plus a tolerance of +/-10%, a penalty shall be levied @ Rs.3,28,154/- per extra kw consumed.

Accordingly, guaranteed losses and overall efficiency of UPS system shall be furnished with offer. A loss capitalization figure Rs.3,28,154/- per kw shall be considered for evaluation of offers

27.0 Sub Vendor List

27.1 Make of the items shall be as follows

27.1.1 ACBs / MCCBs	:	Siemens / L&T / Schneider / ABB/ GE
27.1.2 Contactors	:	Siemens / L&T / Schneider / ABB
27.1.3 Switches	:	Siemens / L&T / Schneider / ABB
27.1.4 Fuses	:	Siemens / L&T / Schneider / ABB/Bussmann
27.1.5 MCBs	:	Siemens / L&T / Schneider / ABB
27.1.6 Rotary switches	:	Siemens / L&T/ Kaycee / Salzer
27.1.7 Other items	:	Reputed make subject to approval.

Technical particulars

Sr.NO.	Item	Remarks filled by vendor
1.0	**UPS-GENERAL**	
1.1	Output voltage with regulation	
1.2	Output frequency with regulation	
1.3	No. of phases/wires at output	
1.4	Continuous output rating	
1.5	Battery backup time	
1.6	Maximum and minimum ambient temperature	
1.7	Whether AC required?	
1.8	Standards to which UPS conform to?	
1.9	Walk in current and time	
2.0	**UPS-MISCELLANEOUS**	
2.1	Guaranteed Power loss (KW)	
2.2	Noise level and distance	
2.3	MTBF of UPS system	
2.4	Radio frequency interference	
3.0	**RECTIFIER**	
3.1	Type	
3.2	Make	
3.3	Connection	
3.4	Whether full wave full controlled	
3.5	Power control device-type/make/designation	
3.6	Maximum/minimum voltage at rectifier output Bus at extreme conditions of input voltage, frequency and load	
3.7	Charging facilities provided	
3.8	Whether selector switch provided for float and boost charger?	
3.9	Whether float and boost charger are separate units?	
3.10	Whether boost charger unit has got auto/manual facility?	
3.11	Preset time for reverting back to float mode after boost charging	
3.12	Whether boost charging & trickle (float) charging current can be manually adjusted?	
3.13	Time required for boost charging the completely discharged battery to fully charged condition	
3.14	Maximum continuous current output of float charger /boost charger	
3.15	Maximum short time current output and duration	

3.16	Whether current limit feature provided in each charger circuit?	
3.17	Type, Make, Rating of mains transformer	
3.18	Whether breaker / isolators provided at rectifier input and output end?	
3.19	Supply mains phase / voltage	
3.20	Mains frequency and range	
3.21	Input line current (maximum)	
3.22	Float charger- output voltage and range	
3.23	do- current range	
3.24	do- method of voltage control	
3.25	Boost charger – Output voltage and range	
3.26	do- current range	
3.27	do-method of voltage control	
3.28	Harmonic content in AC mains at rated load with battery connected/ disconnected	
3.29	do- at 50% load	
3.30	Whether rectifier is 12 Pulse type?	
4.0	**INVERTER**	
4.1	Type	
4.2	Make	
4.3	Static power control device (Type/Make)	
4.4	Output voltage	
4.5	Phase/No. of wires	
4.6	Voltage regulation	
4.7	Output frequency	
4.8	Free running frequency regulation	
4.9	Power factor ranging	
4.10	Rated power	
4.11	Output of the inverter in case of cooling fans fails	
4.12	Harmonic distortion	
4.13	Recommended maximum /minimum DC input bus voltage	
4.14	Duration in minutes of permissible over load of 10 %	
4.15	Duration in minutes of permissible over load of 25 %	
4.16	Duration in minutes of permissible over load of 50 %	
4.17	No load input current	
4.18	Efficiency at rated load	
4.19	Efficiency at 75% load	
4.20	Efficiency at 50% load	
4.21	Transient response in terms of output voltage variation for step load changes of ± 50%	
4.22	Recovery time to ± 15% ,± 5% ,± 2% of rated voltage for the above step variation	

4.23	Transient response in terms of output voltage variation for step load changes of ±100%	
4.24	Recovery time to ± 15% ,± 5% ,± 2% of rated voltage for the above step variation	
4.25	Output voltage regulation while charger is in boost mode	
4.26	Whether both synchronous and asynchronous operation with selection switch available?	
4.27	Adjustable frequency range in synchronous / asynchronous modes	
4.28	Whether facility for manual adjustment of output voltage provided? If yes, furnish range	
5.00	**STATIC SWITCH**	
5.1	Whether static switch is zero break type?	
5.2	No. of poles / phases and voltage	
5.3	Rating	
5.4	Switching device	
5.5	Whether both manual and automatic transfer facility with selector switch provided?	
5.6	Whether push button provided for manual transfer operation of static switch?	
5.7	Time for synchronous transfer/ retransfer	
5.8	Frequency range in which the synchronous transfer/retransfer is permitted	
5.9	Can the static switch transfer / retransfer the load automatically if the frequencies are out of the permitted range? If yes, furnish the minimum time delay provided.	
5.10	Whether inhibit circuit is provided to prevent zero break transfer, if frequencies are not within the permitted range?	
5.11	Whether both manual and automatic retransfer facility are provided?	
5.12	If automatic retransfer facility is provided, how is hunting between inverter and reserve supply prevented?	
5.13	Whether manual bypass switch is provided? If yes, state number of poles and makes	
5.14	Furnish voltage, current rating of the manual bypass switch	
5.15	Is manual bypass switch make before break type?	
5.16	Panel in which static switch is located	

5.17	Location of manual bypass switch	
6.0	**RESERVE SUPPLY**	
6.1	Name major components in the reserve supply line	
6.2	Is the main transformer double wound, vacuum impregnated and dry type?	
6.3	Main transformer- make	
6.4	Main transformer- voltage ratio	
6.5	Main transformer- KVA rating	
6.6	Main transformer- tapings provided	
6.7	Stabilizer- type, make	
6.8	Stabilizer- KVA rating	
6.9	Stabilizer- voltage	
6.10	Stabilizer- no. of phases	
6.11	Output voltage regulation for specified variation in voltage and frequency of AC input supply	
6.12	Transient response in terms of output voltage variation with recovery time for step load changes of	
	(a) ± 50%	
	(b) ± 100%	
7.0	**COOLING ARRANGEMENT**	
7.1	Method of cooling	
7.2	Fan- make	
7.3	Fan- voltage / power rating	
7.4	Fan- RPM/sweep	
7.5	No. of fans and redundancy provided	
7.6	Source of supply for cooling fans	
8.0	**DISTRIBUTION BOARD**	
8.1	Existing ACDB to be utilized	
9.0	**PARALLEL OPERATION**	
9.1	Whether inverters are suitable for parallel operation?	
10.0	**PROTECTION**	
10.1	Name protections provided for rectifier	
10.2	Name protections provided for inverter	
10.3	Name protections provided for static switch	
10.4	Name protection provided for reserve supply scheme	
10.5	Make and ratings of isolator/breaker provided	
	(a) Between AC mains and rectifier	
	(b) For battery	
	(c) At inverter output	
	(d) For AC mains for reserve supply	
	(e) At static switch output bus	
11.0	**METERS AND INDICATIONS**	

11.1	Furnish list of frequency meters	
11.2	Furnish list of ammeters	
11.3	Furnish list of volt meters	
11.4	Furnish list of visual annunciations	
11.5	Furnish list of visual/audio annunciations	
11.6	Furnish list of remote annunciations	
12.0	**PANELS**	
12.1	List of panels	
12.2	Panel enclosure	
12.3	Degree of protection	
12.4	Panel dimensions	
12.5	Power bus size and material	
12.6	Earth bus material and size	
12.7	Whether anti-condensation heater provided? If yes, voltage and power rating	
12.8	Whether lamp provided inside the panels?	
12.9	Minimum size of control wires	
12.10	Cable entry	
12.11	Paint and colour	
13	**BATTERY**	
13.1	Type	
13.2	Make	
13.3	Standards to which the battery conforms?	
13.4	Number of Cells	
13.5	Rated voltage of the battery bank	
13.6	Maximum/minimum voltage of the battery bank	
13.7	AH capacity	
13.8	Nominal voltage of cell	
13.9	End voltage of cell	
13.10	Float charge voltage of cell	
13.11	Max. Boost charge voltage of cell	
13.12	Type of Electrolyte and quantity per cell	
13.13	Recommended specific gravity at the end of full charge	
13.14	Expected specific gravity at the end of discharge.	
13.15	Recommended maximum period of storage before the first charge.	
13.16	Internal resistance of cell	
13.17	Total resistance across battery set output terminals	

Compliance statement

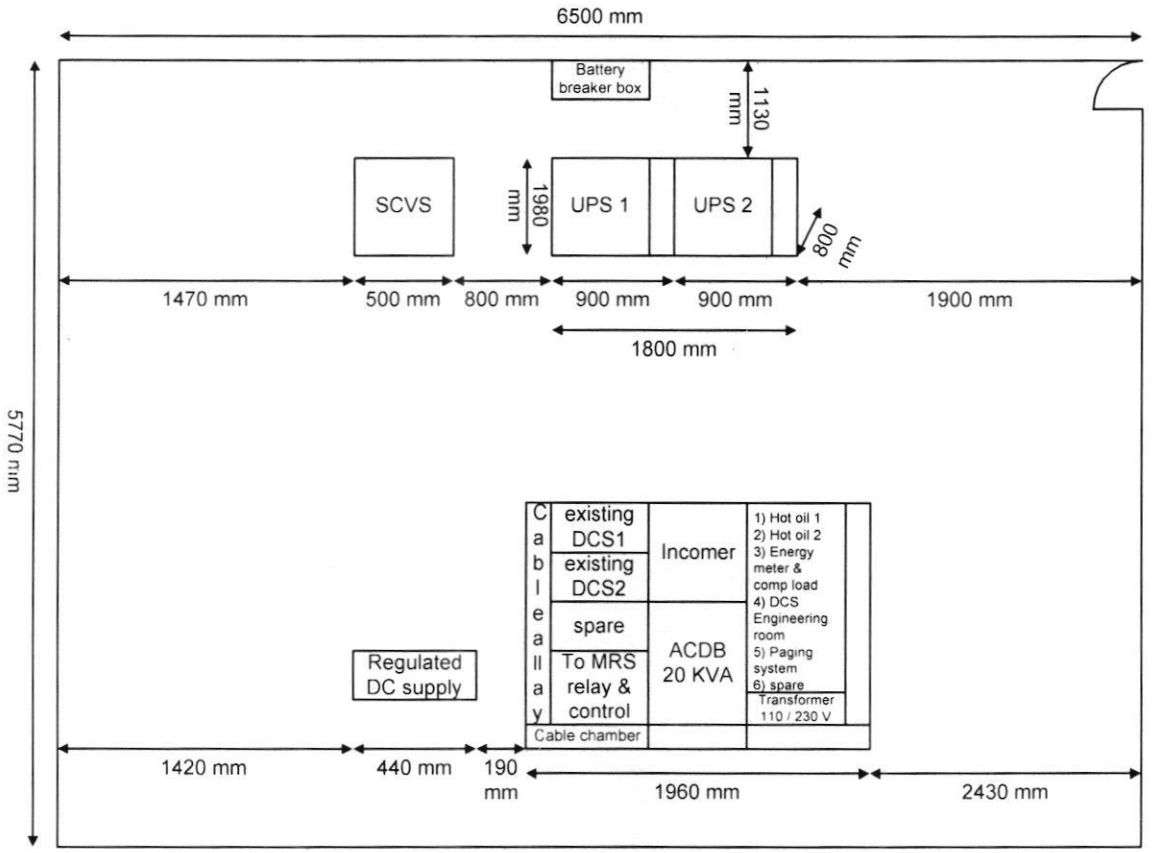
We state that our Quotation No..... is in full compliance with the documents

Issued against the Enquiry No .... except for the deviations listed below

S.No	Description / Deviation	Reasons for Deviation
Name of Vendor:		

Date : Name & Designation : Seal & Signature :

Sketch of existing UPS room layout (Air conditioned)



SKETCH OF EXISTING UPS ROOM
M/s. HOCL Ambalamugal

Configuration principles (Parallel redundant with static bypass 15 KVA)