



TRANSMISSION CORPORATION OF TELANGANA LIMITED  
(Website: www.tstransco.in CIN No: U40102TG2014SGC094248)

From  
The Chief Engineer /P&MM,  
Room No.-207, B-Block,  
TSTRANSCO,  
Vidyut Soudha,  
Hyderabad – 500 082.

To  
M/s. Dubas Engineering Pvt. Ltd.,  
#43(p), Electronics City II-Phase,  
Hosur Main Road,  
Bangalore – 560 100  
Tel:080-40336193.

P.O.No. 249 PMM/2018/CE/P&MM/SE/P&MM/DE31/F. TSPMM31-43/2017(Battery & Battery Chargers) /D.No.326/18, dt.11-12-2018.

Sirs,

Sub:- TSTRANSCO - P&MM – Telecom - Specn.no.TSPMM31-43/2017 – Supply, Erection & Commissioning of 48V Battery and Battery Chargers – Detailed Purchase Order - Issued - Reg.

Ref:- 1. Tender Specification No.TSPMM31-43/2017

2. Your offer on e- platform against Specification No. TSPMM31-43/2017.

3. LOI.No.CE/P&MM /SE/P&MM/DE-31/F.TSPMM31-43/2017/D.No.133/18,  
Dt.31-07-2018.

4. Your LOI acknowledgement vide Lr., Dt:20.08.2018.

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I, acting for and on behalf of and by the order and direction of TRANSMISSION CORPORATION OF TELANGANA LTD., (herein after called the "TSTRANSCO" or "the purchaser") accept your offer, vide ref. 2<sup>nd</sup> cited, for Supply, Erection & Commissioning of 48V Battery and Battery Chargers for the quantities, as per the provision for quantity variation vide clause 34 (Section III, GTC) of tender specification, at an evaluated total package cost of **Rs. 2,46,77,761.00** (Rupees Two Crores Forty Six Lakhs Seventy Seven Thousand and Seven Hundred and Sixty One only) as indicated below and the details are in Annexure-1 (Schedule of Prices). This Purchase Order is issued in confirmation of LOI issued vide ref.(3) cited, accepted by you vide ref.(4) cited.

#### SCOPE OF CONTRACT:

This contract relates to the Supply, Erection & Commissioning of 48V Battery and Battery Chargers detailed under clause (2) below and covers design, manufacture, testing before dispatch, delivery F.O.R. destination.

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- 2) **SCHEDULE OF MATERIALS AND PRICES:** Supply, Erection & Commissioning of 48V Battery and Battery Chargers (inclusive of Freight, Insurance, Packing & Forwarding and GST) detailed in annexure.

Sl. No.	Description	Total Amount (in Rs.)
1	Supply, Erection & Commissioning of 48V Battery and Battery Chargers including all Taxes. (Details in Annexure-I)	2,46,77,761.00
	<b>Total Package value:</b>	<b>2,46,77,761.00</b>
(Rupees Two Crores Forty Six Lakhs Seventy Seven Thousand and Seven Hundred and Sixty One only)		

- 2.1 The Prices accepted above are FIRM during the process of the contract and until the warranty period is completed.
- 2.2 The prices accepted are inclusive of Freight, Insurance, Packing & Forwarding and GST.
- 2.3 The above prices are inclusive of unloading charges at destination stores.
- 2.4 M/s. Dubas Engineering Pvt. Ltd is responsible for all the Taxes applicable on this contract.
- 2.5 Income Tax, other taxes if any, will only be towards the supplier's account and would be recovered from the supplier bills for arranging payment as directed by the concerned department.
- 2.6 **STATUTORY VARIATION:** It is responsibility of bidder to consider the correct rates of the duties and taxes leviable on the equipment/material/work at the time of bidding. After considering the correct rates of duties and taxes only the bidder shall quote the prices.

Any variation up or down in statutory levy or new levies introduced after tender calling date under this specification will be to the account of TSTransco, provided in cases where delivery schedule is not adhered to by the contractor/manufacturer and there are upward variation/revision after the agreed delivered date, the contractor/manufacturer will bear the impact of such levies and if there is downward variation/revision, the TSTransco will be given credit to the effect.

In case of bought out items statutory variation shall not be applicable on that taxes and duties. For this purpose, bought out items means the material/equipment not manufactured by the bidder i.e. statutory variation will be applicable on taxes and duties involving direct transaction between bidder and TSTransco only and not for the taxes and duties between the bidder and his sub vendors.

- 2.7 The purchaser reserves the right to vary the order quantity by  $\pm 50$  % during execution of the contract.

- 3) **DELIVERY:** (Details are in Annexure-2)
- a. Consignment -1: The Supplies shall be completed within 2 months from the date of issue of LOI. Erection and Commissioning of the equipment shall be completed within 1 month from the date of intimation from TSTransco, for the Substations which are ready.
  - b. Consignment -2: The Supplies shall be completed within 2 months thereafter (i.e., 4 Months from the date of issue of LOI). Erection and Commissioning of the equipment shall be completed within 1 month from the date of intimation from TSTransco, for the Substations which are ready.
- 4) **FREIGHT & TRANSIT INSURANCE:** Insurance shall be arranged by the supplier to cover transit risks and 45 days storage cover at site. The insurance will be in an amount equal to 100% FADS value of equipment on all-risks basis. The policy shall have a provision for extension to cover further storage if necessary at destination stores/site at TSTransco cost.
- 5) **DESPATCH INSTRUCTIONS:** The Dispatch instructions for the equipment will be issued separately after inspection.

The details of consignee, paying officer and other officers will be furnished along with dispatch instructions, while approving the Inspection/Test Certificates.

6) **PERFORMANCE SECURITY:**

- 6.1 The supplier shall furnish to the purchaser the performance security in the name of **The Chief Engineer/P&MM, TSTransco, VidyutSoudha, Hyderabad-82**, for an amount equal to 10% of the total contract value i.e. for an amount of **Rs. 24,67,776/-** for proper fulfillment of the contract, shall include the warranty period and completion of performance obligations including warranty obligations. The performance security will cover 60 days beyond the date of completion of performance obligations including warranty obligations.
- 6.2 The performance security shall be executed in accordance with the clause (6), furnished on a stamp paper of value Rs.100/-. The B.G shall be extended if required suitably, in accordance with the provisions of Clause (38) of specification.
- 6.3 In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected / replaced material shall have to be extended to a further period of 12 months and the Performance Bank Guarantee for proportionate value shall have to be extended 60 days over and above the extended warranty period.

The proceeds of the performance security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to fulfill its obligations under the Contract.

6.4 The performance security will be...

- a). A bank guarantee issued by a scheduled bank not acceptable to the Purchaser, in the form provided in the bidding documents. The Bank guarantees may be obtained from the state Bank of India or Nationalized Banks.
- b). A banker's Cheque or crossed DD or Pay Order payable at the Head quarter of the Purchaser in favor of the Purchaser drawn on any scheduled bank/ state Bank of India or Nationalized Banks.

**7) TERMS OF PAYMENT:-**

- i) a) 80% payment towards the equipment cost will be arranged within 45 days for the material/equipment supplied in complete shape subject to their delivery as per the schedule of work and on its receipt in good condition at the destination / stores (i.e., from check measurement date in Form-13), on prorata basis against the submission of the following documents.

- i) Form 13
- ii) Contractor's detailed invoice
- iii) Detailed Challan Acknowledged by Consignee
- iv) Manufacturer's/Supplier's Warranty Certificates
- v) Approved Test Certificates
- vi) Copy of Insurance Policy Certificate
- vii) Copy of Acceptance Letter of Performance Security issued by Purchaser

One additional copy each of the above and delivery challan shall be sent to the consignees. Copies of the above documents shall be sent to the Chief Engineer/ P&MM/TSTransco, VidyutSoudha, Hyderabad-82 immediately after delivering the materials at the destination stores.

- b) 10% payment towards equipment cost will be made after erection of equipment/ material on prorata basis against the submission of invoice.
- c) Balance 10% payment towards equipment cost will be made along with the total erection & commissioning charges after commissioning of equipment / material duly certified by concerned Divisional Engineer/Telecom on prorata basis against the submission of invoice.
- ii) The Supplier Bank details are as detailed below for RTGS payment (Real Time Gross Settlement).

1	Vendor Name	Dubas Engineering Pvt. Ltd
2	Complete Address	M/s. Dubas Engineering Pvt. Ltd., #43(P), Electronic City II-Phase, Hosur Main Road, Bangalore – 560 100,Tel:080-40336193.
3	Name of the Bank	AXIS Bank Ltd.
4	Branch Address	Corporate Banking Branch, “Express Building”, 2 <sup>nd</sup> Floor, No.1 Queens Road, Bangalore – 560001.
5	Swift Code	AXISINBBA06
6	Account No.	914030010612274
7	IFSC No.	UTIB0001541
8	Income Tax PAN No.	AAACD7283M

The Bank details as above are final and shall not be revoked under any circumstances. The Bank Charges if any will be made to the account of M/s. Dubas Engineering Pvt. Ltd, and will be recovered from the bill amount per each disbursement on LOA raised by unit officers.

No interest will be payable in case the payment is delayed for whatever reason.

The Banker charges involved if any in establishing and operating the Cheque / Bills shall be to your account.

- iii) If the supplier has received any over-payments by mistake or if any amounts are due to the TSTransco due to any other reason, when it is not possible to recover such amounts under this contract, the TSTransco reserves the right to collect the same from any other amounts and / or Bank guarantees given by you due to or with the TSTransco.
  - iv) The supplier should invariably submit Inspection/test certificates and other documents that the purchaser specifies, before dispatch is made so that they can be checked and approved well before it is dispatched and due for payment.
  - v) When the supplier does not at any time, fulfill his obligations in replacing / rectifying etc. of the damaged / defective materials in part or whole, promptly to the satisfaction of the TSTransco Officers, the TSTransco reserves the right not to accept the bills against subsequent dispatches made by the supplier and only the supplier will be responsible for any demurrages, wharf ages or damage occurring to the consignments so dispatched.
- 8) **CURRENCY OF PAYMENT:** All payments will be made in non-convertible Indian Rupees.
- 9) **WARRANTY:** The equipment shall be guaranteed for satisfactory performance for a period of 36 months from the date of check measurement in form-13 i.e the date of receipt of goods in the departmental stores/site in good condition.

During this period, if the equipment is found defective it shall be replaced or repaired by you free of all costs to the TSTRANSCO within 30 days, which shall in no circumstances be more than the delivery period indicated in this order.

In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected / replaced material shall be extended to a further period of 12 months and the Performance Bank Guarantee for proportionate value shall be extended 60 days over and above the extended warranty period.

The proceeds of the performance security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to fulfill its obligations under the Contract.

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- 10) **RESPONSIBILITY OF THE SUPPLIER FOR LOSS OR DAMAGE:** The supplier is responsible for the safe delivery of the goods in good condition at the destination stores. He should acquaint himself of the conditions prevailing for handling and transport of the goods to the destination and shall include and provide for security and protective packing of the goods so as to avoid damage in transit.
- 11) **PACKING:** The supplier shall provide such packing of the Materials / equipment as is required to prevent their damage or deterioration during transit to their final destination, as indicated technical specification. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Materials / equipment final destination and the absence of heavy handling facilities at all points in transit.
- 12) **INSPECTION:** The accredited representative of the TSTransco have access to you or your sub-contractor's works at any time during the working hours for the purpose of inspecting the materials during manufacture of the plant and equipment and testing, and may select samples from the materials going into the plant and equipment. You shall on such occasions provide proper and adequate facilities for testing the selected samples at any time. The final acceptance tests and routine tests shall be conducted in the presence of TSTransco's representative who will be deputed for the purpose.
- The program of inspection is to be intimated to the TSTransco with 15 days prior notice for acceptance tests. The goods shall not be dispatched until such inspection is conducted or waived in writing and followed by dispatch clearance communicated by the purchaser in writing.
- 13) **TESTS AND CERTIFICATES:** Three copies of the test certificates containing the results of all the tests including acceptance and routine tests carried out shall be forwarded to Chief Engineer/P&MM and got approved before the presentation of the bills for payment.
- The manufacturer's test certificates shall be submitted immediately after the acceptance tests are conducted and got approved before the equipment is dispatched.
- 14) **GUANTED TECHNIAL PARTICULARS** The Guaranteed Technical Particulars are indicated in Annexure-3 (A, B, C, D, E and F).
- 15) **DRAWINGS:**  
Drawings of 48V/35(1+1), 48V/50A(1+1) & 48V/100A(1+1) Battery Chargers and 48V/200AH, 48V/250AH, 48V/400AH Battery sets were approved vide Lr.No.CE/P&MM /SE/P&MM/DE-31/F.TSPMM31-43/2017(Batt.) /D.No.310/18, Dt.27-11-18.

- 16) **GENERAL CONDITIONS OF CONTRACT:** Except in so far as it is provided otherwise in this contract, you shall abide by the terms and conditions indicated in the Tender specification No. TSPMM31-43/2017 which includes the TSTransco's General Terms and Conditions of contract' enclosed to the ref (1). "Except as specifically accepted in this order, the terms and conditions mentioned in your quotation under reference are not accepted".
- 17) **RISK:** The risk in the property is entirely yours till the goods are received in good condition at destination stores as certified by the consignee.
- 18) **PENALTY FOR DELAY IN SUPPLIES:** The time for and the dates for delivery mentioned in the contract will be deemed to be the essence of the contract. Subject to force majeure clause No.18, if the supplier fails to deliver any or all of the Materials / equipment or fails to perform the services within the period (s) specified in the Contract, the purchaser will, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to 0.5% per week on the undelivered portion subject to a maximum of 5% of the total value of the contract. Once the maximum is reached the Purchaser may consider termination of the contract.

The check measurement date in form-13 i.e., date of receipt of materials at destination stores/site in good condition will be taken as the date of delivery. Materials / Equipment which are not of acceptable quality or are not conforming to the specification would be deemed to be not delivered. For penalty, the number of days would be rounded off to the nearest week and penalty calculated accordingly.

The penalty specified above will be levied and would be adjusted against subsequent pending bills.

- 19) **FORCE MAJEURE:** The Supplier will not be liable for forfeiture of its performance security, penalty for late delivery, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

For purposes of this clause, "Force Majeure" means an event beyond the control of the supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not restricted to, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

If a Force Majeure situation arises, the supplier will promptly notify the Purchaser in writing of such condition and the cause thereof. Unless or otherwise directed by the Purchaser in writing, the Supplier will continue to perform its obligations under the Contract as far as is reasonable in practice, and will seek all reasonable alternative means for performance not prevented by the Force Majeure event.

No price variance will be allowed during the period of force majeure.

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- 20) CORRESPONDANCE:** Your acknowledgement to this order and any correspondence, general or technical in nature shall be addressed to the Chief Engineer/P&MM, TSTransco, Vidyut Soudha, Hyderabad-500082.

All correspondence regarding dispatch and payment shall be addressed to the consignee under intimation to the Chief Engineer/P&MM, Vidyut Soudha, Hyderabad-82.

- 21) COMPLETENESS OF CONTRACT:** All minor accessories that are normally necessary for satisfactory and efficient operation of the equipment shall be supplied by you free of cost to the TSTransco, whether these are specifically mentioned or not in the specification, your tender schedules or in this Purchase Order and the equipment shall be complete in itself.

- 22) OPERATION AND MAINTENANCE MANUALS:** One set of Manuals consisting of operating instructions and programming schedules and approved drawings for each of the equipment shall be supplied in the package along with respective equipment's at the time of dispatch. They shall contain clear instructions on erection, commissioning and maintenance for the guidance of operating staff. Any items requiring the special attention of the Operation Engineer shall be highlighted.

- 23) CONTRACT AMENDMENTS:** No variation in or modification of the terms of the contract will be made except by written amendment by the Purchaser and accepted by the supplier

**24) TERMINATION FOR DEFAULT:**

- 24.1** The purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Supplier, may terminate this Contract in whole or in part:

- i. If the supplier fails to deliver any or all of the Materials / equipment within the period(s) specified in the Contract, or within any extension thereof granted by the Purchaser.
- ii. If the supplier fails to perform any other obligations under the contract.
- iii. If the supplier, in the judgment of the purchaser has engaged in corrupt or Fraudulent practices in competing for or in executing the contract.

- 24.2** In the event the purchaser terminates the contract in whole or in part, the purchaser may procure, upon such terms and in such manner, as it deems appropriate, materials/equipment or services similar to those undelivered, and the supplier will be liable to the purchaser for any excess costs for such similar materials/equipment or services. However, the supplier will continue performance of the contract to the extent not terminated.

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**25) TERMINATION FOR INSOLVENCY:**

The Purchaser may at any time terminate the contract by giving written notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the supplier, provided that such termination will not prejudice or not affect any right of action or remedy, which was accrued or will accrue thereafter to the Purchaser.

**26) TERMINATION FOR CONVENIENCE:**

(a) The Purchaser, by written notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination will specify the termination is for the Purchaser's convenience, the extent to which performance of the supplier under the Contract is terminated and date upon which termination becomes effective.

(b) However the materials/equipment those are complete and ready for shipment within Thirty (30) days after the supplier's receipt of notice of termination will be accepted by the purchaser at the contract terms and prices.

**27) JURISDICTION:** All and any dispute or differences arising out of or touching this order will be decided by the courts or tribunals situated in Hyderabad or Secunderabad only. No suit or other legal proceedings will be instituted elsewhere.

**28) ACKNOWLEDGEMENT:** Please acknowledge this order soon on its receipt by returning the extra copy of the order enclosed, duly signing it with date in token of acceptance.

Yours faithfully,

Sd/-

Chief Engineer/P&MM

(Acting for and on behalf of TSTRANSCO)

Encl.: 1. Annexures –1(Schedule of Prices)  
2. Annexures –2 (Delivery Schedule)  
3. Annexures –3 (GTPs)

"WE ACCEPT THE TERMS AND CONDITIONS STIPULATED IN THIS P.O."

Signature of the Contractor with seal

Copy to:

The Executive Director/Finance/ TSTransco/Vidyut Soudha/Hyderabad.

The Pay Officer/TS TRANSCO/Vidyut Soudha/ Hyderabad

The SAO/ P&A/ TSTransco/Vidyut Soudha/Hyderabad.

The FA&CCA/ACCOUNTS/TSTransco/Vidyut Soudha/Hyderabad.

The Chief Engineer/Telecom/Vidyuth Soudha/Hyderabad.

The Superintending Engineer/Telecom/TSTransco /132/33KVSS Opp. to Court Jagityala road, Karimnagar-500501.

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The Superintending Engineer/Telecom/Metro/ TSTransco /132KVSS Chilakalaguda/ Hyderabad  
The Superintending Engineer/Telecom/ TSTransco / 220KV SS/ Mulugu Road / Warangal  
The Superintending Engineer/Telecom/Rural/ TSTransco / GTS Colony/ Erragadda/Hyderabad  
The SE/OMC/Metro-Central /Hyderabad /TSTransco/NIMS GIS/Erramanjil/Hyderabad.  
The SAO/OMC /Metro Central/ TSTransco/NIMS/ Hyd. ----- (Through e-mail)  
The Superintending Engineer/OMC/Sangareddy ----- (Through e-mail)  
The Superintending Engineer/OMC/Mahaboobnagar ----- (Through e-mail)  
The Superintending Engineer/OMC/Nalgonda ----- (Through e-mail)  
The Superintending Engineer/400 KV/Construction/Metro/Hyderabad ----- (Through e-mail)  
The Superintending Engineer/OMC/Metro-West/Hyderabad ----- (Through e-mail)  
The Superintending Engineer/OMC/Metro-East/Hyderabad ----- (Through e-mail)  
The Superintending Engineer/OMC/Karimnagar ----- (Through e-mail)  
The Superintending Engineer/OMC/Nizamabad ----- (Through e-mail)  
The Superintending Engineer/OMC/Adilabad ----- (Through e-mail)  
The Superintending Engineer/OMC/Warangal ----- (Through e-mail)  
The Superintending Engineer/OMC/Khammam ----- (Through e-mail)  
The Divisional Engineer/Telecom/220KVSS/Mulugu Road/Warangal --- (Through e-mail)  
The Divisional Engineer/ Telecom/132KVSS/Karim Nagar --- (Through e-mail)  
The Divisional Engineer/ Telecom/132KVSS/Mettuguda/Mahaboobnagar--- (Through e-mail)  
The Divisional Engineer/ Telecom/ 132KVSS /Nizamabad --- (Through e-mail)  
The Divisional Engineer/ Telecom/ 132KVSS /Adilabad--- (Through e-mail)  
The Divisional Engineer/ Telecom/ 132KVSS Nalgonda --- (Through e-mail)  
The Divisional Engineer/ Telecom/132KVSS /Ellandu Road/Khammam --- (Through e-mail)  
The Divisional Engineer/ Telecom/ Sangareddy/Mint Compound/First Floor Stone Building /  
Hyderabad-500063 --- (Through e-mail)  
The Divl. Engineer/ Telecom/400KVSS/Mamidipalli/Pahad-e-Sharif/Hyd--- (Through e-mail)  
The Divisional Engineer/ Telecom/ Metro/Narayanaguda GIS/Hyderabad --- (Through e-mail)  
The Divisional Engineer/Transmission Stores/ Metro-Central/Erragadda/GTS Colony/ Hyd.  
The Asst. Executive Engineer/Transmission Stores/220KVSS Shapurnagar/Hyd.

**Tender Specification No.: TSPMM31-43/2017; P.O.No.249 , Dt.:11 .12.2018**

**Annexure-1(Schedule of prices)**

(All figures are in Indian Rupees)

Sl. No.	Description of the equipment	UOM	Total Tender ed Qty	Units Ex-work price	Unit Freight charges	Unit Insurance charges	Packing and Forwarding	Unit Erection & Commissioning charges	Unit landed Price	GST@18 % on Unit Ex- works +F+I+ P&F +E&C	GST@28 % on Unit Ex- works +F+I+ P&F+E&C	Unit landed Price with taxes	Total landed price inclusive of all taxes
<b><u>48V Battery Chargers</u></b>													
1	Supply, Erection & Commissioning of 48V/35A (1+1) Float cum boost Charger	Nos.	33	134441.00	2000.00	200.00	1000.00	5000.00	142641.00	25675.38		168316.38	5554440.54
2	Supply, Erection & Commissioning of 48V/50A (1+1) Float cum boost Charger	Nos.	31	146441.00	2000.00	200.00	1000.00	5000.00	154641.00	27835.38		182476.38	5656767.78
3	Supply, Erection & Commissioning of 48V/100A (1+1) Float cum boost Charger	Nos.	4	178441.00	2000.00	200.00	1000.00	5000.00	186641.00	33595.38		220236.38	880945.52
<b><u>48 V Batteries</u></b>													
4	Supply, Erection & Commissioning of 48V/200 AH SMF VRLA Battery Set	Nos.	64	73140.00	0	0	0	0	73140.00		20479.20	93619.20	5991628.80
5	Supply, Erection & Commissioning of 48V/ 250 AH SMF VRLA Battery Set	Nos.	20	89700.00	0	0	0	0	89700.00		25116.00	114816.00	2296320.00
6	Supply, Erection & Commissioning of 48V/ 400 AH (1+1) SMF VRLA Battery Set	Nos.	7	281520.00	0	0	0	0	281520.00		78825.60	360345.60	2522419.20
<b><u>Battery Cable</u></b>													
7	Supply of 25 Sq.mm. Battery cable	mtrs.	6965	210.00	5	1	0	0	216.00	38.88		254.88	1775239.20
Total (Rs.)													24677761.04
<b>Or say in Rs. 2,46,77,761.00</b>													

(Rupees Two Crores Forty Six Lakhs Seventy Seven Thousand and Seven Hundred and Sixty One only)

Sd/-  
Chief Engineer/P&MM

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**Tender Specification No.: TSPMM31-43/2017;P.O. No.249, Dt.:11.12.2018**

**Annexure-2 Delivery Schedule**

Sl. No	Description of the equipment	UOM	Total Qty.	Consignment-1	Consignment-2	Delivery Schedule	Destination for delivery of material
1	Supply, Erection & Commissioning of 48V/35A(1+1) Float cum boost Charger	Nos.	33	17	16	<b><u>Consignment-1:</u></b> The Supplies shall be completed within two months from the date of issue of LOI. Erection and commissioning of equipment shall be completed within one month for the substations which are ready from the date of intimation from TSTRANSCO	Anywhere in Telangana State
2	Supply, Erection & Commissioning of 48V/50A(1+1) Float cum boost Charger	Nos.	31	16	15		
3	Supply, Erection & Commissioning of 48V/100A(1+1) Float cum boost Charger	Nos.	4	2	2		
4	Supply, Erection & Commissioning of 48V/200 AH SMF VRLA Battery Set	Nos.	64	32	32		
5	Supply, Erection & Commissioning of 48V/ 250 AH SMF VRLA Battery Set	Nos.	20	10	10	<b><u>Consignment-2:</u></b> The Supplies shall be completed within two months thereafter (4 months from the date of LOI). Erection and commissioning of equipment shall be completed within one month for the substations which are ready from the date of intimation from TSTRANSCO	
6	Supply, Erection & Commissioning of 48V/ 400 AH (1+1) SMF VRLA Battery Set	Nos.	7	4	3		
7	Supply of 25 Sq.mm. Battery cable	mtrs.	6965	3500	3465		

Sd/-  
Chief Engineer/P&MM

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**Annexure-3**

**A. GUARANTEE TECHNICAL PARTICULAR FOR 48V, 35A (1+1) Float Cum Boost Charger**

1	Manufacturer's Type & Designation	DUBAS Make, DFCBC 48VDC,35A
2	Input AC supply	
a	Voltage	1φ-2Wire, 160-290V AC
b	Frequency	50Hz, ±5%
c	Power Factor	0.8 at rated load minimum input
3	Type of Rectifier (IEC-60146)	1φ, Full wave controlled Bridge
4	Type of semiconductor material	Silicon mono Crystalline
5	Automatic voltage regulator type	Static control, Constant voltage current limit
6	Float cum boost charger rating	
a	Auto Float voltage (Nominal)	53V (2.2Vpc)
b	Charger output continuous current	35A
c	Manual Float voltage Adjust (Through Pot)	50 – 56V, +/-5V (Recommended 2.27Vpc max. for VRLA)
d	Manual Boost voltage Adjust (Through Pot) (Should be Off load boost charging)	56 – 65V, +/-5V (Not recommended for VRLA)
e	Battery charging Current Adjust (Through Pot)	10 – 35A (Recommended 30A for 200Ah VRLA)
f	Load voltage (When chargers are healthy on float)	48 – 52V (By dropper diode. Dropper diodes will be bypassed by a contactor in case of AC mains fail to connect total battery across the DC load)
g	Load current (Max)	15A continuous (DVR Rated for )
7	Auto / Manual feature is provided	Yes
8	Rectifier Transformer (IS-2026)	
a	Type	Dry Type, Double Wound, Class-H insulation, Class-F temperature rise
9	In Auto mode, during trickle charging, the charger output voltage variation for specified AC voltage & Frequency variation	±1% of set value @ feedback point
10	Maximum ripple content at rated load, nominal input	≤4mV psophometric without battery connect
11	Efficiency at Rated load, nominal input	≥75%
12	Maximum permissible temperature rise over an ambient temperature of 45°C.	110°C (For magnetic) 65°C (For Rectifier stack)
13	Protections	
	a) Output soft start	Yes
	b) Output over load	110% for short time
	c) Input UV/OV alarm, Thermal magnetic trip	Yes
	d) Output short circuit & Over voltage	Yes
	e) Total load current & Battery Current Limit	Yes
14	Protection Class / Paint Shade	IP-30 /631 of IS-5
15	Internal wiring	600/1100V grade, PVC insulated, stranded copper conductor
16	Measuring instruments	Analog, Flush mount, 90° Scale, 72Sqmm, Class2.5
17	Indication & Alarms	Refer Drawing
18	DCDB Detail (inbuilt)	Feeder – 06A, SP, DC MCB – 18Nos
19	ADDB Detail (inbuilt)	Feeder – 06A, SPN, AC MCB – 6Nos

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**Annexure-3**

**B. GUARANTEE TECHNICAL PARTICULAR FOR 48V, 50A (1+1) Float Cum Boost Charger**

1	Manufacturer's Type & Designation	DUBAS Make, DFCBC 48VDC,50A
2	Input AC supply	
a	Voltage	1φ-2Wire, 160-290V AC
b	Frequency	50Hz, ±5%
c	Power Factor	0.8 at rated load minimum input
3	Type of Rectifier (IEC-60146)	1φ, Full wave controlled Bridge
4	Type of semiconductor material	Silicon mono Crystalline
5	Automatic voltage regulator type	Static control, Constant voltage current limit
6	Float cum boost charger rating	
a	Auto Float voltage (Nominal)	53V (2.2Vpc)
b	Charger output continuous current	50A
c	Manual Float voltage Adjust (Through Pot)	50 – 56V, +/-5V (Recommended 2.27Vpc max. for VRLA)
d	Manual Boost voltage Adjust (Through Pot) (Should be Off load boost charging)	56 – 65V, +/-5V (Not recommended for VRLA)
e	Battery charging Current Adjust (Through Pot)	10 – 50A (Recommended 38A for 250Ah VRLA)
f	Load voltage (When chargers are healthy on float)	48 – 52V (By dropper diode. Dropper diodes will be bypassed by a contactor in case of AC mains fail to connect total battery across the DC load)
g	Load current (Max)	15A continuous
7	Auto / Manual feature is provided	Yes
8	Rectifier Transformer (IS-2026)	
a	Type	Dry Type, Double Wound, Class-H insulation, Class-F temperature rise
9	In Auto mode, during trickle charging, the charger output voltage variation for specified AC voltage & Frequency variation	±1% of set value @ feedback point
10	Maximum ripple content at rated load, nominal input	≤ 4mV psophometric without battery connect
11	Efficiency at Rated load, nominal input	≥75%
12	Maximum permissible temperature rise over an ambient temperature of 45°C.	110°C (For magnetic) 65°C (For Rectifier stack)
13	Protections	
	a) Output soft start	Yes
	b) Output over load	110% for short time
	c) Input UV/OV alarm, Thermal magnetic trip	Yes
	d) Output short circuit & Over voltage	Yes
	e) Total load current & Battery Current Limit	Yes
14	Protection Class / Paint Shade	IP-30 /631 of IS-5
15	Internal wiring	600/1100V grade, PVC insulated, stranded copper conductor
16	Measuring instruments	Analog, Flush mount, 90° Scale, 72Sqmm, Class2.5
17	Indication & Alarms	Refer Drawing
18	DCDB Detail (inbuilt)	Feeder – 06A, SP, DC MCB – 24Nos
19	ADDB Detail (inbuilt)	Feeder – 06A, SPN, AC MCB – 6Nos

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**Annexure-3**

**C. GUARANTEE TECHNICAL PARTICULAR FOR 48V, 100A (1+1) Float Cum Boost Charger**

1	Manufacturer's Type & Designation	<b>DUBAS Make, DFCBC 48VDC,100A</b>
2	Input AC supply	
a	Voltage	1 $\phi$ -2Wire, 160-290V AC
b	Frequency	50Hz, $\pm 5\%$
c	Power Factor	$\geq 0.8$ at rated load minimum input
3	Type of Rectifier (IEC-60146)	1 $\phi$ , Full wave controlled Bridge
4	Type of semiconductor material	Silicon mono Crystalline
5	Automatic voltage regulator type	Static control, Constant voltage current limit
6	Float cum boost charger rating	
a	Auto Float voltage (Nominal)	53V (2.2Vpc)
b	Charger output continuous current	100A
c	Manual Float voltage Adjust (Through Pot)	50 – 56V, $\pm 5V$ (Recommended 2.27Vpc max. for VRLA)
d	Manual Boost voltage Adjust (Through Pot) (Should be Off load boost charging)	56 – 65V, $\pm 5V$ (Not recommended for VRLA)
e	Battery charging Current Adjust (Through Pot)	20 – 100A (Recommended 60A for 400Ah VRLA)
f	Load voltage (When chargers are healthy on float)	48 – 52V (By dropper diode. Dropper diodes will be bypassed by a contactor in case of AC mains fail to connect total battery across the DC load)
g	Load current (Max)	40A continuous
7	Auto / Manual feature is provided	Yes
8	Rectifier Transformer (IS-2026)	
a	Type	Dry Type, Double Wound, Class-H insulation, Class-F temperature rise
9	In Auto mode, during trickle charging, the charger output voltage variation for specified AC voltage & Frequency variation	$\pm 1\%$ of set value @ feedback point
10	Maximum ripple content at rated load, nominal input	$\leq 4mV$ psophometric without battery connect
11	Efficiency at Rated load, nominal input	$\geq 75\%$
12	Maximum permissible temperature rise over an ambient temperature of 45°C.	110°C (For magnetic) 65°C (For Rectifier stack)
13	Protections	
	a) Output soft start	Yes
	b) Output over load	110% for short time
	c) Input UV/OV alarm, Thermal magnetic trip	Yes
	d) Output short circuit & Over voltage	Yes
	e) Total load current & Battery Current Limit	Yes
14	Protection Class / Paint Shade	IP-30 /631 of IS-5
15	Internal wiring	600/1100V grade, PVC insulated, stranded copper conductor
16	Measuring instruments	Analog, Flush mount, 90° Scale, 72Sqmm, Class2.5
17	Indication & Alarms	Refer Drawing
18	DCDB Detail (inbuilt)	Feeder – 06A, SP, DC MCB – 24Nos
19	ADDB Detail (inbuilt)	Feeder – 06A, SPN, AC MCB – 6Nos

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**Annexure-3**

**D. GUARANTEE TECHNICAL PARTICULAR FOR 48V UPST 200Ah VRLA Battery**

1	Manufacturer's Type & Designation	Exide Make 48V UPST 200Ah VRLA Battery
2	Capacity in AH at 27 ° C	
(i)	Initial	200
(ii)	Rated	200
(iii)	End of Life	160
3	Capacity at Various Discharge Rates at 27°C	
a	Period of 10Hr Discharge for 200 AH Capacity	Discharge Current- 20.0 Amp End Cell Voltage- 1.75 Volts
b	Period of 1Hr Discharge for 100 AH Capacity	Discharge Current- 100.0 Amp End Cell Voltage- 1.7 Volts
4	Maximum Momentary Current for 1 min up to cut off voltage of 1.6 V	600 Amps
5	Expected Fault at bus due to battery	1200 Amps
6(i)	Short Circuit Current at Battery terminals	1200 Amps
(ii)	Time for which the battery can withstand short circuit at terminals	5 Sec
7	Type/No. of Negative Plates per cell	Flat pasted, 4(I) + 2(E)
8	Type/No. of Positive Plates per cell	Flat pasted 5
9	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk) (Inter) 315(L) x 140(W) x 1.9 (+/- 1) (Thk) (End)
10	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
11	Type of Connection between cells	Bolted rigid copper connectors
12	Type of Separators	Absorptive glass mat
13	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
14	Dimension of 2 volts cell ( LXWXH ) , mm	167(+/-3)mm x 87(+/-3)mm x 394 (+/- 5) mm
15	Material of Container	Polypropylene Co-polymer
16	Recommended Charging Rate	
(i)	Float Charging Voltage	
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC
(ii)	Float Charging Current	30 Amps (Max)
(iii)	Boost Charging Voltage	2.35 Volts
(iv)	Boost Charging Current	40 Amps
(v)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)
17	Guaranteed efficiencies at 10 hrs rate	
	(a) Ampere-hour efficiency	90%
	(b) Watt-hour efficiency	80%
18	Internal Resistance of each cell at Fully Charged Condition	0.99 milli ohms min

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19	Overall Dimensions of each complete module with Top Cover( LxWxH) in mm	Length 588 +/- 5, Width 415 +/- 5(w/o base member), Width 452 +/-5 (with base member), Height 210 +/- 5; ( 6 cells module);
20	Weight of unpacked and complete module with electrolyte ; Kgs	83.1 +/- 5% Kgs (Single 6 cell module)
21	Material of Modules	Powder coated MS
22	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
23	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshening charge once in every three months, however if stored at higher or lower temperature freshening charge to be provided as recommended.
24	Amount of Hydrogen evolved during normal normal float charging	Less than 200ppm normal float condition
25	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually
26	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
27	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.
28	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998, ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

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**Annexure-3**

**E. GENERAL TECHNICAL PARTICULAR FOR 48V UPST 250Ah VRLA Battery**

1	Manufacturer's Type & Designation	Exide Make 48V UPST 250Ah VRLA Battery
2	Capacity in AH at 27 ° C	
(i)	Initial	250
(ii)	Rated	250
(iii)	End of Life	200
3	Capacity at Various Discharge Rates at 27°C	
a	Period of 10Hr Discharge for 250 AH Capacity	Discharge Current- 25.0 Amp End Cell Voltage- 1.75 Volts
b	Period of 1Hr Discharge for 125 AH Capacity	Discharge Current- 125.0 Amp End Cell Voltage- 1.7 Volts
4	Maximum Momentary Current for 1 min up to cut off voltage of 1.6 V	750 Amps
5	Expected Fault at bus due to battery	1500 Amps
6(i)	Short Circuit Current at Battery terminals	1500 Amps
(ii)	Time for which the battery can withstand short circuit at terminals	5 Sec
7	Type/No. of Negative Plates per cell	Flat pasted; 7
8	Type/No. of Positive Plates per cell	Flat pasted; 6
9	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk)
10	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
11	Type of Connection between cells	Bolted rigid copper connectors
12	Type of Separators	Absorptive glass mat
13	Thickness of Separators	4.2 (2 layers of 2.1 mm each)
14	Dimension of 2 volts cell ( LXWXH ) , mm	167(+/-3)mm x 126(+/-3)mm x 394 (+/- 5) mm
15	Material of Container	Polypropylene Co-polymer
16	Recommended Charging Rate	
(i)	Float Charging Voltage	
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC
(ii)	Float Charging Current	37.5 Amps (Max)
(iii)	Boost Charging Voltage	2.35 Volts
(iv)	Boost Charging Current	50 Amps
(v)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)
17	Guaranteed efficiencies at 10 hrs rate	
	(a) Ampere-hour efficiency	90%
	(b) Watt-hour efficiency	80%
18	Internal Resistance of each cell at Fully Charged Condition	0.86 milli ohms min
19	Overall Dimensions of each complete modular ( LxWxH) in mm	Length 588 +/- 5, Width 460 +/- 5, Height 288 +/- 5; ( 6 cells module);
20	Weight of unpacked and complete module with electrolyte ; Kgs	100 +/- 5% Kgs (Single 6 cell module)
21	Material of Modules	Powder coated MS

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22	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
23	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshening charge once in every three months, however if stored at higher or lower temperature freshening charge to be provided as recommended.
24	Amount of Hydrogen evolved during normal float charging	Less than 200ppm normal float condition
25	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually
26	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
27	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.
28	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998, ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

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**Annexure-3**

**F. GENERAL TECHNICAL PARTICULAR FOR 48V UPST 400Ah VRLA Battery**

1	Manufacturer's Type & Designation	Exide Make 48V UPST 400Ah VRLA Battery
2	Capacity in AH at 27 ° C	
(i)	Initial	400
(ii)	Rated	400
(iii)	End of Life	320
3	Capacity at Various Discharge Rates at 27°C	
a	Period of 10Hr Discharge for 400 AH Capacity	Discharge Current- 40.0 Amp End Cell Voltage- 1.75 Volts
b	Period of 1Hr Discharge for 200 AH Capacity	Discharge Current- 200.0 Amp End Cell Voltage- 1.7 Volts
4	Maximum Momentary Current for 1 min up to cut off voltage of 1.6 V	1200 Amps
5	Expected Fault at bus due to battery	2400 Amps
6(i)	Short Circuit Current at Battery terminals	2400 Amps
(ii)	Time for which the battery can withstand short circuit at terminals	5 Sec
7	Type/No. of Negative Plates per cell	Flat pasted; 11
8	Type/No. of Positive Plates per cell	Flat pasted; 10
9	Size of negative plates, mm	315(L) x 140(W) x 2.65 (+/- 1) (Thk)
10	Size of positive plates, mm	315(L) x 140(W) x 4.5 (+/- 1) (Thk)
11	Type of Connection between cells	Bolted rigid copper connectors
12	Type of Separators	Absorptive glass mat
13	Thickness of Separators	4.5 (2 layers of 2.25 mm each)
14	Dimension of 2 volts cell ( LXWXH ),mm	167(+/-3)mm x 172(+/-3)mm x 378 (+/- 5) mm)
15	Material of Container	Polypropylene Co-polymer
16	Recommended Charging Rate	
(i)	Float Charging Voltage	
	between ambient temp. (-)5-14 ° C	2.27 +/- 0.02 VPC
	between ambient temp. 15-24 ° C	2.25 +/- 0.02 VPC
	between ambient temp. 25-34 ° C	2.23 +/- 0.02 VPC
	between ambient temp. 35-40 ° C	2.20 +/- 0.02 VPC
(ii)	Float Charging Current	60 Amps (Max)
(iii)	Boost Charging Voltage	2.35 Volts
(iv)	Boost Charging Current	80 Amps
(vii)	Time taken to full charge from 100% discharge state by constant voltage charging & voltage at the end of this charge	72 Hrs (Min) 2.1 volts(ocv)
17	Guaranteed efficiencies at 10 hrs rate	
	(a) Ampere-hour efficiency	90%
	(b) Watt-hour efficiency	80%
18	Internal Resistance of each cell at Fully Charged Condition	0.42 milli ohms min
19	Overall Dimensions of each complete modular ( LxWxH) in mm	Length 619 +/- 5, Width 445 +/- 5, Height 388 +/- 5; ( 6 cells module);

20	Weight of unpacked and complete module with electrolyte ; Kgs	156.3 +/- 5% Kgs (Single 6 cell module)
21	Material of Modules	Powder coated MS
22	Whether explosion vents are offered	Yes, self re-sealing rubber safety valve with flame arrestor
23	The period for which the battery should be stored after supply in charged conditions	If stored in Indian ambient temp of 30 deg C cells will need freshening charge once in every three months, however if stored at higher or lower temperature freshening charge to be provided as recommended.
24	Amount of Hydrogen evolved during normal float charging	Less than 200ppm normal float condition
25	Recommended interval at which battery should be discharged at 10 hr discharge rate	Once annually
26	No. of charge-discharge cycle battery can give during its entire life	
	at 20% DOD	4000 cycles
	at 50% DOD	1800 cycles
	at 80% DOD	1400 cycles
27	Expected Life of Battery in years	20 Yrs at 27 deg C in ideal float condition.
28	Applicable standard	IEC 60896 - 21 & 22, JIS : C 8704-2, : 1998, ANSI T1 330, GR/BAT-01/03-MARCH 2004, IS 15549 : 2005

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