

TECHNICAL PROCUREMENT SPECIFICATION

for

Battery Chargers
in

FACT-UC

TPS NO. : FACT-UC-BC-2019-20

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1. INTRODUCTION

- 1.1. This specification covers the minimum user requirements for Battery chargers for FACT Udyogamandal Complex (FACT- UC), Kochi, Kerala consisting of Petrochemical Plants and Fertilizer Plants.
- 1.2. The Fertilizers And Chemicals Travancore (FACT) is a Government of India Enterprise engaged in Manufacture of Fertilizer, Chemical & Petrochemical products, Engineering consultancy and Engineering fabrication. FACT-Udyogamandal Complex (FACT-UC) is a division of FACT located at Udyogamandal, Kochi, Kerala that manufactures intermediates and products like Sulphuric acid, Ammonia, Ammonium Phosphate, Ammonium Sulphate, Caprolactam etc.
- 1.3. Vendor's scope shall include design, manufacturing, testing, supply, commissioning and training of the Battery charger, as further described in sections that follow.
- 1.4. The project is intended to commission three numbers of Battery Chargers in Petrochemical Plant Main Control Room, Fertilizer Plants 11kV Substation and Telephone Exchange of FACT respectively.
- 1.5. Bidder who quotes against this enquiry shall meet the Pre-Qualification Criteria as mentioned in the enquiry. Offers from Bidders who do not meet the PQ criteria will not be considered for evaluation.
- 1.6. Bidder may visit the plant before quoting and get all required information regarding location, site conditions and existing facilities.
- 1.7. Workmanship shall be of highest quality and the entire construction shall be in accordance with the best modern engineering practices.
- 1.8. Technical bid and price bid shall be submitted separately, as specified in the enquiry. An un-priced copy of the price bid shall be attached with the technical bid for evaluation.
- 1.9. Only offers that comply with the requirements as specified in the bid documents and specification shall be considered for further evaluation. If the vendor however finds some deviation unavoidable, such deviations shall be clearly mentioned in the compliance and deviation statement in the specified format (Annexure III) with proper justification. The purchaser reserves the right to reject or accept the offer with such deviations.

2. PERIOD OF COMPLETION

- 2.1. The vendor shall complete the supply of chargers within a period of 10 weeks from date of drawing approval. The drawings for approval shall be submitted within 10 days from the date of LOI/PO. Comments/Approval on drawings will be given by purchaser within 10 days from the submission of drawings. Revised final drawings for final approval, after incorporating the all comments/changes from Purchaser, if any, shall be submitted within 10 days from the date of receipt of comments. Time is of the essence of this contract. The vendor shall complete the supply of the charger within the time specified above.

3. SCOPE OF WORK

- 3.1. Bidder's scope includes, but not limited to supply of Battery chargers as described in this specification.
- 3.2. The chargers are intended to get commissioned in Petrochemical Plants Main Control Room, Fertilizer Plants 11kV Substation and Udyogamandal Complex Telephone Exchange.
- 3.3. The Vendor's scope includes design, manufacturing, factory acceptance test, supply, site acceptance tests, commissioning and training of the complete system, meeting the Technical Procurement Specification.
- 3.4. Laying, glanding and termination of all the cables are under purchaser's scope.
- 3.5. All required supporting frames, mounting brackets, clamps, lugs, glands, hardwares and all accessories for erection shall be supplied by purchaser.
- 3.6. Transportation of the items from FACT Udyogamandal stores to the site shall be done by purchaser.
- 3.7. Erection and installation of panels and battery banks shall be done by the purchaser. Testing and Commissioning assistance is under vendor's scope. Dismantling of existing chargers and battery banks are under purchaser's scope.
- 3.8. Buyback of old battery banks for chargers cited at Fertilizer Plants 11kV Substation and Udyogamandal Complex Telephone Exchange are to be included in bid. Payment for commissioning assistance shall be released only after taking back the old battery bank under buyback scheme, to supplier's premises/disposal yard as per standards.

4. **STANDARDS**

- 4.1 The design, selection of equipment, testing and commissioning of the chargers and all connected accessories shall confirm to the latest Indian/International Standards/codes.
- 4.2 The codes and standards applicable shall be the latest revisions as on the date of placement of order and shall be referred to and complied with, in their entirety.

5 **GENERAL REQUIREMENTS**

- 5.1 The battery chargers are very critical by way that shutdown of these equipment results in heavy financial losses apart from the safety aspects of personnel and other equipment. Hence the equipment offered shall be of proven design and shall maintain very high standards with respect to reliability and quality of power output.
- 5.2 The float and boost charging circuits shall be complete with required transformers, solid state devices, control cards, voltage / current controllers, suitably rated control switches and HRC fuses, contactors, necessary ammeters, voltmeters, indicating lamps, alarms, relays, etc. for the efficient operation of the charger, as per manufacturer's standard practice.
- 5.3 The following isolation provisions shall be provided as the minimum requirement:
- Incoming power supply
 - Battery
 - Load
 - Control circuit
- 5.4 The battery charger shall have two separate float cum boost charger circuits which are parallel redundant to feed the loads and charge battery bank in both float and boost mode (Details of batteries attached in data sheet).
- 5.5 During boost charging mode the load voltage is to be maintained within limits as mentioned in data sheet, by utilizing either tap cell voltage arrangement at the battery side OR by adopting suitable technology in chargers as per manufacturer's standard practice. Adequate number of rated dropper diodes in required steps shall be provided in the load circuit as per requirement. However, during boost charging the voltage across the load bus shall not exceed 5% above the rated output voltage unless otherwise specified in data sheet.

- 5.6 An Auto/Manual selection feature shall be provided (float and boost) for change over to manual operation of the charger in the case of failure of Auto operation.
- 5.7 The AC input voltage and DC output voltage rating of the battery charger shall be as specified in the data sheet.
- 5.8 When power supply AC mains is ON, the maximum permissible momentary voltage variation across the load bus , for step load changes like motor starting , energisation of breaker closing solenoids, etc. shall be within $\pm 10\%$, unless otherwise specified in the data sheet.
- 5.9 Soft start feature shall be provided in the charger so that when the charger is switched ON, the output voltage shall increase gradually from zero to final value without any voltage over shoot.
- 5.10 There should not be a failure of DC supply at load bus in the event of mains failure during boost charging or float charging.
- 5.11 The float and boost charger circuit shall be suitable for floating various types of batteries such as lead-acid, nickel cadmium etc, while supplying the continuous load current specified in the data sheet. Facility shall be provided for minor adjustment of float voltage to regulate the trickle charging current and / or compensate line drop voltage.
- 5.12 The boost charger circuit shall be suitable for charging the battery at the maximum charging current allowable for the battery (details mentioned in data sheet). The boost charger shall have facility to charge at constant current and / or at constant voltage.
- 5.13 If specified in the data sheet, the battery charger shall have both Auto and Manual modes. In the Auto mode the solid-state circuits provided shall sense the demand for more charging current persisting beyond a preset time and the charging operation shall go automatically to boost mode. Automatic changeover from boostcharging mode to float mode shall be as per standard manufacturer's practice.
- 5.14 Chargers for Petro-Main Control room does not require battery bank. Chargers intended for Fertilizer Plants 11kV Substation and Udyogamandal Complex Telephone Exchange shall be supplied along with VRLA battery bank with buyback facility for existing banks (refer data sheet for details). Existing battery for Telephone Exchange is of 165 AH Ni-Cad type and is to be replaced with suitably rated VRLA and the offered charger shall be compactable to the VRLA bank.

6 **PROTECTION**

- 6.1 The components shall be selected to provide sufficient voltage capability and ample current carrying capacity to furnish a reasonable margin for handling over currents and voltage variations and to limit temperature rise of components to safe values.
- 6.2 Transient suppressing circuits and high speed fuses shall be used to protect the semiconductor devices.
- 6.3 All semiconductor circuits shall be protected using fuse or breaker so as to prevent cascade or sequential semiconductor failures.
- 6.4 The battery charger shall have all 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, short circuits, earth faults, etc.
- 6.5 The battery shall be given separate MCCB/suitable protection.
- 6.6 Air break switches / circuit breakers of adequate rating and suitable number of poles shall be provided to fully isolate the charger from supply mains, battery and load. The isolation contacts shall ensure least contact resistance while in service.

7 **ANNUNCIATIONS**

- 7.1 Repetitive type visual and audible alarm shall be provided for various conditions of the Battery charger system as per manufacturer's design philosophy.
- 7.2 Potential free contacts shall be provided for initiating common alarm for any charger fault, at remote location. For this, necessary contacts shall be wired up to the terminal block in the charger panels.

8 **METERING**

- 8.1 Provision for displaying the following parameters shall be available:
- a. Charging current during float operation

- b. Boost charging current
- c. Load current
- d. Battery discharge current
- e. Charger DC output voltages
- f. Battery voltage
- g. Voltage across the tap from battery, if any
- h. Voltage across the DC load bus

9 **CONSTRUCTION**

- 9.1 The main transformers, charging circuits, DC outlets, switches, fuses, contactors, relays, hooters and all other accessories of each charger shall be accommodated in a self-contained, self-standing, floor mounted, damp and vermin proof, sheet steel cubicle of folded construction.
- 9.2 The enclosure and protection of the cubicles shall be as specified in the data sheet. Special requirements applicable if any on cubicle dimensions shall be furnished in the data sheet.
- 9.3 The cubicles shall have hinged doors with locking facility. All doors and removable covers shall be gasketed all round with non-aging rubber/ neoprene gaskets.
- 9.4 All controls and indicating instruments shall be flush mounted on the front side and shall be arranged so as to give a neat appearance. Labels shall be provided for designating each component mounted on the panel.
- 9.5 All components shall be mounted with ample clearance in between them for convenience of operation, inspection and maintenance.
- 9.6 Cubicles shall be provided with necessary internal panel lamps
- 9.7 The cubicles shall be designed, suitable for the maximum ambient temperature specified in the data sheet.
- 9.8 The cubicles shall be complete with inter connecting cables, wires etc.
- 9.9 Cable entry shall be from top / bottom for each unit with removable gland plate as specified in the data sheet. Cable sizes shall be indicated in the data sheet. Suitable terminal assembly to be provided for termination of power cables.
- 9.10 Necessary nameplates giving relevant particulars of the equipment shall be provided

on individual equipment / component.

9.11 The paint shall be as per RAL 7032.

9.12 Facility for handling the equipment at site, such as lifting lugs, shall be provided.

10 WARRANTY AND PERFORMANCE GUARANTEE

10.1 The Bidder shall provide full warranty covering all hardware for a period of 12 months from the date of commissioning of the system or 18 months from the date of supply, whichever is earlier. The warranty shall also cover all bought-out items by the Bidder including battery bank, for the period mentioned.

10.2 Bidder shall have full defect liability during the warranty period. It shall be obligatory on the part of Bidder to modify / replace any hardware, free of cost, in case defect/ shortcoming/ malfunction are noticed during the warranty period.

10.3 The supplier shall provide a performance guarantee for the system including software as per the specification and the terms and conditions of the purchase order, and shall be released only after successful completion of the warranty and AMC period.

11 TRAINING

11.1 Training shall be provided at site free of cost for the purchasers' engineers and technicians.

12 USER MANUALS

12.1 Detailed technical catalogues for all components shall be supplied along with technical bid.

12.2 Three hard copies and a soft copy of Operation and Maintenance Manual with diagrams shall be supplied as per Vendor Data Requirements (Clause 16).

13 INSPECTION, TESTING AND COMMISSIONING

13.1 Testing and commissioning of the charger panels are under the scope of the supplier. Necessary labor assistance shall be provided by purchaser.

13.2 The bidder shall arrange a Pre-Dispatch Inspection which is to be carried out at bidder's test facility witnessed by the purchaser, for functionality of the system excluding battery bank.

- 13.3 Tests for PDI shall be as per suppliers approved testing plan.
- 13.4 The Bidder shall verify the full operational functionality of the system by performing a site acceptance test (SAT) after installation of all equipment. Initial charging/discharging cycle of battery at sufficient load is also included in the scope of SAT. Vendor shall arrange assistance of battery OEM, if required, during SAT for supervision of commissioning and testing Charging/discharging parameter log sheets to be submitted as per manufacturer's standard practice. SAT shall be carried out before acceptance and handing over of the system. The system shall be considered for acceptance only if its performance complies with the Technical requirements as per TPS.

14 COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT

- 14.1 The bidder shall quote for comprehensive AMC of the three chargers for a period of three years effective from the expiry of warranty/ guarantee period. Replacement/repair of any hardware required during the AMC period shall be under the scope of vendor. The AMC shall include upkeep/renewal/up gradation as applicable. The AMC shall be comprehensive, that is, including supply of all spares and service. The work order for AMC will be awarded separately for three years after warranty/guarantee period.
- 14.2 The AMC shall be for the entire system including bought out items, except battery bank.
- 14.3 The AMC rates quoted shall be valid and firm for the entire three year period of CAMC.
- 14.4 Payment against CAMC services shall be made on quarterly basis, after successful completion of the quarterly service of all the three chargers and submission of invoice and certification by Engineer in- Charge.
- 14.5 The AMC shall include the following:
- [i] Technical support round the clock over telephone, e-mails etc. to facilitate the first level maintenance by engineers/technicians of the purchaser.
 - [ii] Service engineer shall attend the system failure/fault within 24 hours of receipt of service call from the purchaser.
 - [iii] The vendor shall make quarterly preventive maintenance visits at an interval of three months for the preventive checking of the system, and ensure
 - a) Healthiness of the system.
 - b) Removal of faults seen during the PM.

- c) Routine maintenance activities.
- [iv] The preventive maintenance checks shall be carried out online without the shut downs of the system.
- [v] The vendor shall restore the defective system within 72 hrs, counting from the intimation of the fault. If the total system is down for more than 72 hours due to reasons attributable to the vendor, 0.5% of the AMC charges will be recovered for each such occurrence(multiples of 72 hours). There is no limit allowed for the number of breakdown calls.
- [vi] Vendor shall ensure sufficient stock of all required spares ready at disposal, including the bought out items to facilitate fast recovery of the fault.
- [vii] The faulty/damaged parts and components, which have been replaced during the maintenance, will be the absolute property of the Contractor.
- [viii] The vendor shall employ personnel having valid Police Clearance Certificate and registered with either ESI/PF or having workmen compensation coverage, for the assigned work, to meet all the statutes.
- [ix] The rates quoted for AMC shall also be included for bid evaluation.

15 **VENDOR DATA REQUIREMENTS**

Sl. No.	Description	With offer		After LOI/PO		Final	
		No.of copies	Date	No.of copies	Date	No.of copies	Date
1	Duly signed Technical Procurement Specification Document	1	With tech bid				
2	Duly filled-in ,signed and stamped Technical Particulars	1	With tech bid				
3	Charger sizing calculation			1	10 days from LOI/PO		
4	Schematic/block drawing	1	With tech bid	1	10 days from LOI/PO	S	Along with Panel
5	Manufacturer's QAP	1	With tech bid				
6	GA diagram of chargers and battery banks			1	10 days from LOI/PO	1P+S	Along with Panel
7	Wiring Diagrams, Terminal wiring Diagrams.			1	10 days from LOI/PO	S	Along with Panel
8	Schedule of materials / components, with quantity, type, make, etc.			1	10 days from LOI/PO	S	Along with Panel
9	Technical literature, pamphlets and brochures relating	1	With tech bid			S	Along with supply
10	Operation, Maintenance and installation manuals					3P+S	Along with Panel
11	Duly filled and signed Compliance statement as per format attached	1	With tech bid				
12	Unpriced copy of price bid	2	With tech bid				

P: Printouts

S:Softcopy

16 DATA SHEET

110V Battery Charger for Petro Main Control room (Data Sheet No : FACT-UC-BC-DS-2019-20-001)		
A		
1	General	
1.1	No. of charger units required	One set consisting of float cum Boost charger, standby float cum boost charger
1.2	Rated DC load bus voltage	110V
1.3	Minimum DC Current Capacity	252A minimum (maximum current capacity of offered charger to be fixed by vendor as per design requirement to match existing charger mentioned in Cl.A.3.9 and A.2)
1.4	Type of load	DC load requirements of interlock relays for instrumentation, annunciators etc
1.5	AC mains- supply voltage and frequency	415 V +/- 10 % and 50 Hz +/- 2.5%
1.6	AC mains- number of wires	Four
1.7	Fault level	35 MVA
1.8	Location of battery and battery charger	Inside Petrochemical Plants Main Control Room (charger and battery in adjacent rooms)
1.9	New Battery bank required (Yes/No)	No
1.10	Ambient temperature	
	a) Maximum	40° C
	b) Minimum	19.2° C
2	Details of existing Battery	
2.1	Type of Battery	Lead Acid
2.2	Make / model	Exide / 7TBS 800
2.3	Capacity	800 AH
2.4	No. of cells	55
2.5	Voltage	110V (2V/cell)
2.6	Tap cell connection	Available
2.7	Float Voltage	2.25V/cell
2.8	Boost voltage	2.75V/cell
3	Battery Charger	
3.1	Charging facilities required	Float cum boost charger with parallel redundant float cum boost charger. Ratings to match the existing charger (details mentioned in A.3.9.4 of data sheet)

3.2	Special requirements if any on load voltage variation	During float charging DC output voltage across load bus shall be maintained within +5% & - 7.5% of 110V for all loads with input 415V +/- 10%, 50Hz +/- 2.5%
3.3	Whether soft start circuit is required?	Yes
3.4	Whether auto / Manual selection required for boost charger?	Yes
3.5	Whether facility to adjust / set the current limit required?	Yes
3.6	DCDB	Not required. Rating of DC Load Output Breaker : 300A
3.7	Audio / visual annunciation facilities required	Required for mains ON, float ON, boost ON, mains over/under voltage, phase failure, battery under voltage, DC bus over/under voltage , overload, earth leakage, AC mains failure etc.
3.8	Provision for remote annunciation	Minimum one potential free contact for common alarm
3.9	Name plate details of existing charger	
3.9.1	Make	Unielec Battery Charger
3.9.2	Type	C3P-C3C-110/252, C3P-110/252
3.9.3	SI No.	FC-2478/88
3.9.4	DC Output	Float cum boost : 145.75V / 252 A Float : 118.25V / 252 A Note : 10% extra allowance in voltage control for charging in boost mode to be considered preferably for offered charger
3.9.5	AC Input	415 +/- 10%, 3 phase, 50 Hz
4	Constructional details	
4.1	Panel Enclosure	Sheet thickness shall be 2mm for frame & 1.6 mm for doors & covers.
4.2	Degree of protection	IP40(min)
4.3	Painting	Powder coated. Final colour finish (RAL 7032)
4.4	Cable entry	Top
4.5	Dimensions of existing charger(W x D x H) in mm	2600 x 820 x 2200 mm including FC and FCBC
4.6	Incoming power supply cable details	3.5C x 240 sq.mm
4.7	Battery cable details	3C x 400 sq.mm
4.8	Charger to DCDB cable details	1R x 3C x 300 sq.mm

B	110V Battery Charger for Fertiliser Plants 11kV Substation (Data Sheet No : FACT-UC-BC-DS-2019-20-003)	
1	General	
1.1	No. of charger units required	Float cum boost charger with parallel redundant float cum boost charger. Ratings to match the existing charger (details mentioned in B.4.9.4 of data sheet)
1.2	Rated DC load bus voltage	110 V
1.3	Minimum DC Current Capacity	35A (Battery-15A,Load-20A) (maximum current capacity of offered charger to be fixed by vendor as per design requirement to match existing charger mentioned in Cl.B.4.9. However, minimum capacity shall be 35A DC)
1.4	Type of load	DC load requirement of LT compartment relays of HT panel, annunciators etc
1.5	AC mains- supply voltage and frequency	230V AC, 50 Hz
1.6	AC mains- number of wires	Two
1.7	Fault level	35 MVA
1.8	Location of battery and battery charger	Inside 11KV sub-station building at Fertilizer Complex (charger and battery in adjacent rooms)
1.9	New Battery bank required (Yes/No)	Yes
1.10	Ambient temperature	
	a) Maximum	40° C
	b) Minimum	19.2° C
2	Details of existing Battery	
2.1	Type of Battery	VRLA
2.2	Make / model	HBL / TRIUMPH-HP 160PP
2.3	Capacity	160 AH
2.4	No. of cells	55
2.5	Voltage	2V / cell
2.6	Tap cell connection	Available
2.7	Float Voltage	2.27V/cell
2.8	Boost Voltage	2.35V/cell
3	Specifications of new battery bank to be supplied	
3.1	Additional requirements for new battery bank	160 AH, 2V, VRLA with minimum specifications same as existing bank. The cells shall be suitable for deep discharge and long life characteristic with reduced gassing. The container shall be designed for better heat dissipation and strength. Terminals shall be lead plated. Suitable fasteners shall be provided with the bank. Cells shall be mounted on suitable mounting

		stand which is suitably divided among racks/stands based on available room size (3600 x 2450 x 3100 mm) and ease of mounting .The stand shall be powder coated. Necessary provision to be considered for terminating main power cable from charger. Interconnection cable between racks, Interconnection cable between charger and battery bank, interconnection links between cells etc. are under the scope of the vendor.
3.2	Warranty	12 months from the date of supply / 18 months from the date of commissioning whichever is earlier.
3.3	Acceptable make	HBL/AMCO/Exide/Prestolite/Amar Raja
4	Battery Charger	
4.1	Charging facilities required	Float cum boost charger with parallel redundant float cum boost charger
4.2	Special requirements if any on load voltage variation	During float charging DC output voltage across load bus shall be maintained within +5% & - 7.5% of 110V for all loads with input 230V +/- 10%, 50Hz +/- 2.5%
4.3	Whether soft start circuit is required/?	Yes
4.4	Whether auto. / Manual selection required for boost charger?	Yes
4.5	Whether facility to adjust / set the current limit required?	Yes
4.6	DCDB	DCDB Not required. Instead 4 nos. 20A DC breakers to be provided on panel with suitably rated incomer.
4.7	Audio / visual annunciation facilities required	Required for mains ON, float ON, boost ON, mains over/under voltage, phase failure, battery under voltage, DC bus over/under voltage , overload, earth leakage, AC mains failure etc.
4.8	Provision for remote annunciation	Minimum one potential free contact for common alarm
4.9	Name plate details of existing charger	
4.9.1	Make	Designs &Prototypes
4.9.2	Type	Nil
4.9.3	SI No.	96-04-091
4.9.4	DC Output	110VDC/35A, BAT 15A,LOAD 20A

		Note : 10% extra allowance in voltage control for charging in boost mode to be considered preferably for offered charger
4.9.5	AC Input	230VAC/34A
5	Constructional details	
5.1	Panel enclosure	Sheet thickness shall be 2mm for frame & 1.6 mm for doors & covers.
5.2	Degree of protection	IP40(min)
5.3	Painting	Powder coated. Final colour finish Light/ Dark Grey (RAL 7032)
5.4	Cable entry	Bottom
5.5	Dimensions of existing charger(W x D x H) in mm	700x400x1100 (Offered charger to accommodate in the existing panel space available)
5.6	Incoming power supply cable details	1Rx2C x 50 sq.mm
5.7	Battery cable details	1Rx2C x 70 sq.mm
5.8	Charger to DCDB cable details	1R x 2C x 70 sq.mm
C	48V Battery Charger for Fertiliser Plants Telephone Exchange (Data Sheet No : FACT-UC-BC-DS-2019-20-004)	
1	General	
1.1	No. of charger units required	Float cum boost charger with parallel redundant float cum boost charger. Ratings to match the existing charger (details mentioned in C.4.9.4 of data sheet)
1.2	Rated DC load bus voltage	48 V
1.3	Minimum DC Current Capacity	35 A minimum (maximum current capacity of offered charger to be fixed by vendor as per design requirement to match existing charger mentioned in Cl.C.4.9 and C.2)
1.4	Type of load	DC load requirement of Telephone Exchange and associated network switches & optical converter
1.5	AC mains- supply voltage and frequency	415 V +/- 10 % and 50 Hz +/- 5%
1.6	AC mains- number of wires	Four
1.7	Fault level	35 MVA
1.8	Location of battery and battery charger	Inside Udyogamandal Telephone exchange building (charger and battery in adjacent rooms)
1.9	New Battery bank required (Yes/No)	Yes
1.10	Ambient temperature	
	a) Maximum	40° C
	b) Minimum	19.2° C

2	Details of existing Battery	
2.1	Type of Battery	Ni-Cd
2.2	Make / model	SNPS / KPL 165P
2.3	Capacity	160 AH
2.4	No. of cells	42
2.5	Voltage	1.2V / cell
2.6	Tap cell connection	Available
3.0	Specifications of new battery bank to be supplied	Required number of 2V,VRLA of suitable AH. (calculation sheet to be attached)
3.1	Additional requirements for new battery bank	The cells shall be suitable for deep discharge and long life characteristic with reduced gassing. The container shall be designed for better heat dissipation and strength. Terminals shall be lead plated. Suitable fasteners shall be provided with the bank. Cells shall be mounted on suitable mounting stand which is suitably divided among racks/stands based on available room size (3000 x 2400 x 3600 mm) and ease of mounting .The stand shall be powder coated.Necessary provision to be considered for terminating main power cable from charger. Interconnection cable between racks, Interconnection cable between charger and battery bank, interconnection links between cells etc. are under the scope of the vendor.
3.2	Warranty	12 months from the date of supply / 18 months from the date of commissioning whichever is earlier.
3.3	Acceptable make	HBL/AMCO/Exide/Prestolite/Amar Raja
4	Battery Charger	
4.1	Charging facilities required	Float cum boost charger with parallel redundant float cum boost charger
4.2	Special requirements if any on load voltage variation	During float charging DC output voltage across load bus shall be maintained within +5% & - 7.5% of 48V for all loads with input 415V +/- 10%, 50Hz +/- 5%
4.3	Whether soft start circuit is required/?	Yes
4.4	Whether auto. / Manual selection required for boost charger?	Yes

4.5	Whether facility to adjust / set the current limit required?	Yes
4.6	DCDB	Separate DCDB not required. Instead, 4 nos. outlets with suitable isolator and fuse arrangement to be provided inside charger panel itself with following ratings: Outlet 1 : 25A, 250V AC/DC Outlet 2 : 15A, 250V AC/DC Outlet 3 : 15A, 250V AC/DC Outlet 4 : 10A, 250V AC/DC (Spare for future use) Suitable rated incomer also to be provided.
4.7	Audio / visual annunciation facilities required	Required for mains ON, float ON, boost ON, mains over/under voltage, phase failure, battery under voltage, DC bus over/under voltage , overload, earth leakage, AC mains failure etc.
4.8	Provision for remote annunciation	Minimum one potential free contact for common alarm
4.9	Name plate details of existing charger	
4.9.1	Make	SAB NIFE Power Systems Ltd
4.9.2	Type	48 TP 35/25 with FCBC and FC with DVR & DCDB
4.9.3	SI No.	FCBC-1672/904 , FC with CVR&DCDB-1671/904
4.9.4	DC Output	48V – 35A Float voltage – 56V, Boost voltage-68V Note : 10% extra allowance in voltage control for charging in boost mode to be considered preferably for offered charger (No separate DCDB available.)
4.9.5	AC Input	415V AC, 50 Hz
5	Constructional details	
5.1	Enclosure	Sheet thickness shall be 2mm for frame & 1.6 mm for doors & covers.
5.2	Degree of protection	IP40(min)
5.3	Painting	Powder coated. Final colour finish Light/ Dark Grey (RAL 7032)
5.4	Cable entry	Bottom
5.5	Dimensions of existing charger(W x D x H) in mm	FCBC – 800 x 600 x1800 mm FC with DVR & DCDB - 80 x 60 x180 mm (Offered charger to accommodate in the existing panel space available)

5.6	Incoming power supply cable details	4C x 16 sq.mm Aluminium cable
5.7	Battery cable details	3R x 1C x 70 sq.mm copper cable

17 **TECHNICAL PARTICULARS**(To be filled by the vendor and submit along the bid)

1.1	Chargers offered and their respective model :	1. 2. 3.
1.2	Output voltage of respective chargers	1. 2. 3.
1.3	Ampere capacity of respective chargers	1. 2. 3.
1.4	Whether soft start feature available?	
1.5	Whether standby float cum boost charger available?	
1.4	Type of Rectifier	
1.5	Whether adjustment of float / boost voltage possible?	
1.6	Whether adjustment of boost current/voltage possible?	
1.7	Whether manual changeover from float to boost facility available?	
1.8	Method adopted for feeding load during boost charging	
1.9	Whether offered 110V charger in Petro Plants compatible for existing Lead Acid batteries mentioned in Clause A.2 of data sheet?	
1.10	Type, voltage and AH capacity of battery offered for 110V Fertilizer Plants Substation and 48V telephone exchange charger.	1. 2.
1.11	Whether potential free contacts available for remote annunciation?	

1.12	No. of dropper diodes for each charger	
1.13	Cable entry provision for respective chargers.	
1.14	Dimensional Details :	
1.14.1	Petro MCR Charger (W x D x H)	
1.14.2	Fert.11kV Substation charger(W x D x H)	
1.14.3	Telephone Exchange Charger (W x D x H)	
1.15	Whether signed and stamped TPS attached?	
1.16	Whether signed and stamped Compliance statement attached?	
1.17	Whether charger sizing calculation attached?	

ANNEXURE - I

Bill of Materials/Services

Sl No.	Description	Unit	Quantity
1.	Battery charger for Petro Plants MCR without battery bank	Set	1
2.	Battery Charger for Fertilizer Plants 11kV Substation with battery bank	Set	1
3.	Battery Charger for Udyogamandal Telephone exchange with battery bank	Set	1
4.	Supervision for Testing and Commissioning of Item-1	LS.	1
5.	Supervision for Testing and Commissioning of Item-2	LS.	1
6.	Supervision for Testing and Commissioning of Item-3	LS.	1
7.	Buyback of old 160AH battery bank for 110V charger at Fertilizer Plants 11kV Substation	Set	1
8.	Buyback of old 165AH battery bank for 48V charger at Telephone Exchange	Set	1
9.	Charges for Comprehensive Annual Maintenance Contract, for three years after warranty period for all three chargers	Per Annum	1

Note 1: Bill of materials shall follow the requirements of Technical Procurement Specification.

ANNEXURE – II : PRICE BID FORMAT

Sl No	Item Code	Description	Unit	Quantity
1.	671411312	Design, manufacturing, supply, testing, commissioning and training of 110V Station Battery Charger without battery bank for Petro MCR, as per attached TPS No: FACT-UC-BC-2019-20(Data Sheet No : FACT-UC-BC-DS-2019-20-001).	Set	1
2.	671411311	Design, manufacturing, supply, testing, commissioning and training of 110V Station Battery Charger complete with 160 AH VRLAbattery bank and its accessories, for Fertilizer Plants 11kV Substation, as per attached TPS No: FACT-UC-BC-2019-20 (Data Sheet No : FACT-UC-BC-DS-2019-20-003).	Set	1
3.	671411314	Design, manufacturing, supply, testing, commissioning, and training of 48V Battery Charger complete with suitably rated VRLA battery bank and its accessories, for Udyogamandal Telephone exchange, as per attached TPS No:FACT-UC-BC-2019-20 (Data Sheet No : FACT-UC-BC-DS-2019-20-004).	Set	1
4.	UE-R-T&C-BC-PETRO	Supervision for testing and commissioning of battery charger for Petro Plants Main Control Room	LS	1
5.	UE-R-T&C-BC-FERT	Supervision for testing and commissioning of 110 Volts battery charger with battery bank at Fertilizer Plants 11kV Substation	LS	1
6.	UE-R-T&C-BC-EPABX	Supervision for testing and commissioning of 48 volts battery charger with battery bank at Udyogamandal Telephone exchange	LS	1
7.	UE-R-BUYBK-BC-FERT	Buyback of old 160AH VRLA battery -55 numbers of 110V Station Battery Charger at Fertilizer Plants 11kV Substation	Set	1
8.	UE-R-BYBK-BC-EPABX	Buyback of old 165AH Ni- Cad battery - 42 numbers of 48V charger at Udyogamandal Telephone Exchange.	Set	1
9.	UE-R-AMC-BC-PETRO1	Charges for Comprehensive Annual Maintenance Contract for 110V battery charger-Petro MCR after the warranty period- Year 1	Year	1
10.	UE-R-AMC-BC-PETRO2	Charges for Comprehensive Annual Maintenance Contract for 110V battery charger-Petro MCR after the warranty period- Year 2	Year	1
11.	UE-R-AMC-BC-PETRO3	Charges for Comprehensive Annual Maintenance Contract for 110V battery charger-Petro MCR after the warranty period- Year 3	Year	1
12.	UE-R-AMC-BC-FERT1	Charges for Comprehensive Annual Maintenance Contract for 110V battery charger-Fert 11 kV substation after the warranty period- Year 1	Year	1
13.	UE-R-AMC-BC-FERT2	Charges for Comprehensive Annual Maintenance Contract for 110V battery charger-Fert 11 kV substation after the warranty period- Year 2	Year	1
14.	UE-R-AMC-BC-FERT3	Charges for Comprehensive Annual Maintenance Contract for 110V battery charger-Fert 11 kV substation after the warranty period- Year 3	Year	1
15.	UE-R-AMC-BC-EPABX1	Charges for Comprehensive Annual Maintenance Contract for 48V battery charger-Telephone exchange after the warranty period- Year 1	Year	1
16.	UE-R-AMC-BC-EPABX2	Charges for Comprehensive Annual Maintenance Contract for 48V battery charger-Telephone exchange after the warranty period- Year 2	Year	1
17.	UE-R-AMC-BC-EPABX3	Charges for Comprehensive Annual Maintenance Contract for 48V battery charger-Telephone exchange after the warranty period- Year 3	Year	1

ANNEXURE III
COMPLIANCE STATEMENT

ENQUIRY No: _____

We state that our Quotation No.....is in full compliance with the documents issued against the Enquiry No:_____except for the deviations listed below.

LIST OF DEVIATIONS:

Sl. No	Description	Reason for deviation

Name of Vendor:

We have read, understood and accepted the terms and conditions of the enquiry as given in the Technical Procurement Specification, Annexures, Terms and Conditions for Purchase attached with the tender documents, except for the deviations distinctively listed above.

Date:

Name & Designation

Seal & Signature