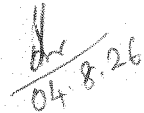
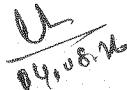


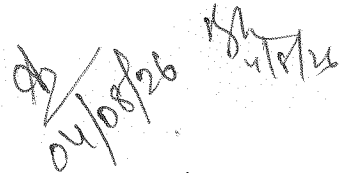
August' 2026

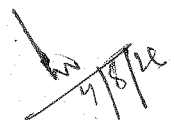
For Pretender Purpose


 04.08.26

 04.08.26

 04/08/26

 04.08.26

 04.08.26

 04/08/26

 04.08.2026.

 4/8/26

 4/8/26

 04/08/26

 04/08/26

**A. TECHNICAL SPECIFICATION FOR 30 V, 50A FLOAT AND AUTOMATIC FLOAT-CUM-BOOST BATTERY CHARGER****1. Scope:**

The specification covers the design, manufacture, testing at the Manufacturer's works, delivery by road transport to different sites of West Bengal State Electricity Distribution Company Limited for Float and Automatic Float cum Boost Battery Charger. The charger shall comprise two **fully independent charging sections**: a Float Charger rated 25 A and a Float-cum-Boost Charger rated 25 A. Under mains-available condition, and when the battery is fully charged, both chargers along with the battery shall remain connected to the load. In this mode of operation, the charger shall be capable of supplying load up to 50 A. When the battery is discharged, the Float-cum-Boost Charger section shall operate in Boost mode to charge the battery, and upon attaining full charge, it shall automatically change over from Boost mode to Float mode. In the event of failure of any one section, the other section shall continue to feed the load and provide trickle charging to the battery.

Supervision and erection of devices shall have to be undertaken by manual acceptance of terms and conditions for the same, if required.

APPLICATION:

The system requires a reliable and uninterrupted D.C. supply for supplying D.C. Power to emergency lights, closing and tripping coils of circuit breakers, relays etc.

2. SERVICE CONDITIONS:

Equipment to be supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions.

Maximum ambient temperature (Degree C)	50
Maximum temperature in shade (Degree C)	45
Minimum Temperature (Degree C)	3
Relative Humidity (percent)	95
Maximum Annual rain fall (mm)	1450
Maximum wind pressure (kg/sq. m)	150
Maximum altitude above mean sea level(Meter)	1500
	50
Isoceraunic level (days per year)	
Seismic Level	The sites fall within seismic zone-III and IV as classified in the IS:1983



Moderately hot and humid tropical climate conductive to rust and fungus growth	
---	--

3.0 Standards:

Unless otherwise specified, the equipment shall conform to latest applicable Indian standard of equivalent IEC, British or USA standard and in particular to the following standard (or equivalent IEC British, USA standard):

IS:3895/1966	Specification for the rectifier equipment
IS:9224	Specification for HRC fuses.
IS: 1248	Indicating instrument.
IS:375 /1963	Specification for wiring
IS: 4540/1968	Mono crystalline semiconductor rectifier assemblies
IS:2026	Transformers
IS:13947/ 1993	Air Break Switch/Contactor
IS: 5/1978	Colour for ready mix paint
IS: 5421/1981	Printed circuit board
IS: 8828/1993	Miniature circuit breaker
IS:2147	Degree of protection for cubicle
IS:6619	Safety code for semiconductor rectifier equipment

The tenderer shall clearly state the standard to which the equipment offered by him conforms.

4.1 SUPPLY: AC input: 240 volts +/- 10 %, 50 HZ +/- 5%, Single phase supply. Input power factor 0.7 minimum at rated load.

4.2 CHARGER SYSTEM OPERATION:

4.2.1—The Float and Float-cum-Boost Battery Charger shall consist of two independent chargers. Under mains-available condition, and when the battery is fully charged, both chargers shall remain connected to the battery and load, with provision to supply a continuous DC load of up to 50 A at 33.75 V. During normal operation, the battery shall remain floated across the charger at 33.75 V (2.25 V per cell), which shall be compatible with the specified battery and simultaneously supply load current up to 50 A. Whenever the battery is discharged and starts drawing more than 1 A from float condition, the Float-cum-Boost Charger shall automatically switch to Boost mode, delivering higher charging current at an increased voltage 38 V (this voltage is settable and may be finalized during detailed engineering), while the Float Charger continues to supply the load. The charger shall provide the required extra



voltage for Boost charging. Once the battery attains the set voltage, the Float-cum-Boost Charger shall automatically revert to Float mode.

4.2.2 During boost charging, voltage across the battery terminal will go higher at the order of about 38 volts for which suitable Automatic solid state dropping device shall be provided (maintain 33.75 Volts ± 2 V volts across the load terminal).

There shall be a provision to set the equalizing voltage at 42 V. Equalizing is required to restore weak cell(s) and may be carried out once every 6 months or 1 year for a limited duration. For this purpose, one spring-return push button shall be provided for selection of the equalizing charge mode. When the battery voltage reaches the preset value of 42 V, the charger shall automatically transfer to Float mode.

4.2.3 Battery Charging Equipment shall be fully automatic for Float and Boost charging facility with suitable indication on front of the panel by means of LED indication. After the battery is fully charged, i.e., when its voltage reaches the set value 38 V, the Float-cum-Boost Charger shall automatically switch over to Float mode. When the battery starts drawing more than 1 A (or as preset) in Float mode operation, the Float-cum-Boost Charger shall automatically switch back to Boost mode. A soft-start feature shall be provided in the system.

4.2.4 The Float-cum-Boost Charger shall be provided with an Auto/Manual selection switch. In Manual mode, for initial charging of the batteries or under any other required condition, potentiometers for setting the desired constant charging voltage and constant charging current shall be provided on the front panel. Provision shall also be made for charging the battery in Equalizing mode.

4.2.5 There shall be 2 (two) nos. 63 A DP MCBs provided for outgoing feeders to extend the DC supply load to the substation DC distribution box. In addition, 1 (one) no. 63 A DP MCB shall be provided for the battery circuit.

4.2.6 Automatic changeover of DC load requirement of substation to Battery in the event of Mains power failure should be without any break. i.e should be made without incorporating any relay in the output DC supply.

4.2.7 Automatic changeover of output to charger supply with restoration of incoming power supply and after meeting short time current requirement from battery.

4.2.8 Arrangement of battery force discharging with suitable rated contractor automatic control.

4.3 **RATING:** 30V DC output, 50 Amp Auto & Manual dual automatic float cum boost Battery Charger.

a) Type : Thyristor controlled



b) At Load Terminal:

During Float charging or Boost charging, the load voltage shall be maintained 33.75 V $\pm$ 2 Volt for AC input voltage variation of $\pm$ 10% and load variation of 0 to 100 %. Also system shall provide 50 Amps continuous current and also momentary current of 63 Amps for one second.

c) At Battery Terminal:

Trickle charge voltage 33.75 volts (2.25V per cell) at 400 mA maximum.

Boost charge voltage 38 volts (adjustable).

d) RIPPLE:

The ripple content in the DC output of Battery Charger shall be limited to 2 % RMS.

e) Regulation: $\pm$ 2%

f) Efficiency: More than 70%

g) Method of cooling : Natural air with proper ventilating arrangement

5.1 COMPONENTS:

5.1.1 The Battery charger shall comprise of following components but not limited to the same:

- a) Double pole AC circuit breaker for AC incoming of the battery charger (MCB) with auxiliary potential free contact for indication to SCADA.
- b) Single phase, double wound, Air Natural Cooled, Vacuum impregnated transformer of CRGO lamination and copper winding.
- c) Single phase, full wave half controlled SCR bridge of 63A rating (Silicon controlled rectifier) together with suitable heat sinks and RC suppression network to take care of momentary high load of 63 Amp. All the electronic components shall be of high MTBF or heavy duty type and liberally rated.
- d) Automatic solid state voltage / current controller for automatic control of voltage and current during float/ boost charging the batteries complete with manual control facility.
- e) Auto /manual mode selector switch with Indication lamp/ LED for respective position.



- f) An Auto/Manual mode selector switch shall be provided for the Float-cum-Boost Charger section to enable manual selection of Boost mode. In Manual mode, adjustable potentiometers shall be provided on the front panel to set the Boost voltage and current.
- g) Provision shall be made with a separate potentiometer on the front panel to adjust the output DC voltage across the load and battery terminals in Float mode. The DC output voltage shall be adjustable within ± 4 V of the nominal 30 V output.
- h) Float/ Boost indicator lamps/LED.
- i) Potentiometers to adjust DC output voltage and current in respective modes.
- j) Battery charging current and voltage requirements are to be regulated by using voltage current feedback loops.
- k) Smoothing (filter) circuit comprising of smoothing choke, and filter condenser to reduce ripple content in the DC output of the Battery charger to 2% RMS.
- l) **The following 4-digit digital meters of size 48×96 mm and suitable rating shall be provided:**
 - i. DC Voltmeter for Load terminal
 - ii. DC Voltmeter for Battery terminal
 - iii. DC Ammeter for Load
 - iv. DC Ammeter for Charge/Discharge current
 - v. AC Voltmeter (Aux. voltage 240 V AC).
- m) DC moving coil Ammeter of 0-25A rating and 96 sq. mm.
- n) DC moving coil Voltmeter of 0-50 V rating and 96 sq. mm. with selector switch and HRC fuse to measure voltage of Charger/ Battery and Load.
- o) Solid state automatic load voltage regulator to maintain the load voltage of $30 \text{ V} \pm 4 \text{ V}$ (rating of the regulator shall be 25 A continuous and 63 A for one second) during Float charging or Boost charging of the Batteries.
- p) Double pole DC circuit breaker of 63 Amp rated for Battery protection (MCB) with auxiliary potential free contact for indication to SCADA.
- q) There should not be any discontinuity of DC supply to the bus bar during any transition period or in the event of AC mains fails and



battery power should be available for tripping circuit, if necessary, even during boost charging.

r) MCB Trip indication lamp/ LED for load and Battery MCB.

s) The indicating instruments shall be of class 1.0 accuracy or better.

t) The following provisions conforming to relevant IS shall be made on the front panel:-

- (i) Voltmeter to indicate battery DC voltage.
- (ii) Voltmeter to indicate charger DC voltage
- (ii) Voltmeter for Input AC supply voltage.
- (iii) Ammeter to indicate Charge/Discharge current of Battery.
- (iv) Ammeter to indicate load DC current.

5.1.2 The Charger shall be provided with following LED of reputed make

Indication:

- (i) Supply of power -- Green
- (ii) Charger on -- Green
- (iii) Battery reverse polarity-Red
- (iv) Input power supply fail – Red
- (v) Output over/under voltage-Red
- (vi) Earth fault- Red

5.1.3 Audio/ Visual alarm to indicate:-

- (i) Power failure.
- (ii) Charger failure.
- (iii) Battery disconnection/failure.
- (iv) DC under/Over voltage.
- (v) Condenser Fuse failure.
- (vi) In case of failure of charger on fault, it should give buzzer as well as LED indication. However, the buzzer alarm should be provided for battery MCB fail, load MCB fail and charger trip due to overload indication with an accept and reset switch. The charger shall have provision for an alarm relay contact for remote Indication. Suitable terminals with identification label shall have to be provided.

5.1.4 Controlling arrangement for following functions shall be provided:-

- a) Auto/Manual Selector Switch for Float cum Boost charger.
- b) Equalizing charger ON / OFF switch.
- c) Float voltage (across battery and load) control potentiometer.



- d) Manual operation controlling device
- e) Accept /Reset push button

5.2 Wiring:Charger cubicle shall be supplied completely wired upto terminals crimping type copper lugs. All wiring shall be carried out with 750 V grades PVC insulated multi-strand copper conductor of -1 Sq mm and shall be flame/vermin proof (FRLS). All wiring shall be neatly bunched without affecting access to equipment/ components mounted within the cabinet. The Charger DC output circuit for Battery and load connection separately shall be wired with 6.00 sq.mm PVC insulated cable.

Suitable two earthing terminal and outgoing terminal shall be supplied to connect the external supply cables.

Control/Indication/Annunciation circuit shall be wired with suitable size of PVC insulated cable as per scheme requirement. Colour coded wires should be used to facilitate easy tracing, as under:-

i. Single Phase A.C. Circuit:-

- (a) Yellow for Phase
- (b) Green for Earthing
- (c) Blue for Neutral

ii. D.C. Circuit:-

- (a) Red for Positive
- (b) Black for Negative

iii. Control Wiring:-

- (a) Gray for annunciation and other control circuits.

b. Ferrules: Embossed/Engraved core identification ferrules, marked to correspond with the wiring diagram shall be fitted at both ends of each wire.

c. Termination:

- The input, battery and load terminals shall be located in easy accessible positions. The terminals shall be properly labelled for easy identification of Input (Ph &Neutral), Battery (positive & negative), Load (Positive &negative) and Emergency Lamp (Positive & negative).
- 3-way Stud type terminal of minimum 25 Amps for input AC supply connection.



- One pair Stud type terminal of minimum 75 Amps for battery and two pair for load supply connection.
- The earth conductor of the cable shall be provided on the charger body.
- All control cables should run through the bottom side of the Charger cubicle with proper gland arrangement.

5.3 Special Feature:

- a) All printed circuits boards used in the Battery charger shall have suitable protective coating for protection against humidity and corrosion.
- b) Transformer shall be with class-F or higher insulation having a continuous rating at least 125% of the rating of the charger. Reactance of the transformer shall be suitable to take care of regulation and surges. The main transformer unit of the battery charger shall be designed for adequate VA rating but in any case it should not be less than 3000 VA for each section, i.e., float and float cum boost section and should be rated for 300 V with adequate factor of safety .
The heat dissipation and power control system should be designed so that junction temperature should not increase 60°C over ambient 50°C. Rating of silicon diode should not be less than 63 A.
Please note that necessary documentary evidence, showing transformer rating of 3000 VA along with test certificate from manufacturer, if bought-out, shall be enclosed, for approval of the purchaser.
- c) Tenderer shall furnish full description and illustration of all components complete with quantity, make, rating, type, tolerance etc. including, but not limited to the list of components given below.
- d) Following make of components shall be used in the Battery charging equipment approved by C.E. (P&E) WBSEDCL.

i)	Switches	Kaycee/ Recom/L&T/ Salzer/UNIQUE AE/IMP /RISHAV/UNIQUE/SECURE/SCHNEIDER/OEM of Battery charger
ii)	Meters	
iii)	Contacts	L&T/Siemens/ABB/C&S
iv)	MCB	MDS/ABB/Siemens/L&T/TEKNIK/HBL/C&S
v)	HRC fuses	S&S/Bussman/Siemens/L&T/HBL/ ABB/C&S/FTC
vi)	SCR	HIRECT/IRI/Semicron/ NSL
vii)	Diode	IR/Semicron/IRI/HIRECT/ NSL
viii)	Lamps/LED	Essen/vaishna/Siemens/L&T/Emco/JIGO



ix)	Filter condenser	Rescon/Alcon/Kendil/Keltron
x)	Potentiometer	Pankaj/Bourns
xi)	Voltmeter A.C.	IMP/AE/Rishav/ Meco/ SECURE/ OEM of Battery charger
xii)	Relays	PLA/OEN/OMRAN/GOOD SKY

e) All other bought out items shall conform to the relevant IS and of reputed make subject to approval of C.E. (P&E) WBSSEDCL.

- f) a) The charger cubicle will be indoor type with all associated and auxiliary equipment mounted therein.
- b) The charger cabinet shall be 1.6 mm. thick sheet steel for Non – Load bearing members & 3 mm for Load bearing members enclosed and shall be dust and vermin proof. The **maximum** overall dimension of the charger shall be height-1800 mm (including the height of Stand), Width – 700 mm and depth – 600 mm.
- c) The cabinet shall be free standing floor mounting type with a provision for proper ventilation. Backside Cover will be double door type. Necessary arrangement on front, back & top side shall be provided for easy access to different components for repair/maintenance etc. The enclosures of the cabinet shall provide at least degree of protection IP-42 as specified in IS: 13947.
- d) All doors, removable covers and plates shall be provided with neoprene gasket all around. Louvers, when provided shall have screens and filters. The screen shall be of fine wire mesh made of G.I. wire.
- e) All sheet steel work shall be degreased, pickled phosphate and then applied with two coats of Zinc primer and two coats of finishing epoxy powder coating or polyethylene protective coating of light gray as per IS : 631, both inside and outside. The cabinet legs shall be of adequate height and strength and should provide minimum clearance of 300 mm from ground.
- f) All fuses shall be of HRC cartridge types conforming to IS: 2208 mounted on plug type fuse bases.
- g) Electrical indicating instruments shall be flush mounted on panel with only flanges projecting. Control and instrument switches shall be of rotary type.



- h) Indicating lamps shall be LED type with low watt consumption.
- i) All door mounted equipments as well as equipment mounted inside the cabinet shall be provided with individual labels with equipment designation

j) **POLARITY MARKING:-**

The polarity marking of the terminals shall be marked for identification. The positive terminal may be identified by "**P**" or **(+)** sign or **Red** colour mark and the negative terminal may be identified by "**N**" or **(-)** or **Blue** colour. Terminal marking shall be permanent and non-deteriorating.

m) **TERMINALS**

Battery charger cabinet shall be provided with two separate suitable earthing terminals. Separate terminals shall be provided for connecting load and battery leads to the charger. All terminals shall be stud type fitted with nut and bolt of adequate size of Minimum 75 A rated. Suitable copper lugs shall be provided by the supplier for use of the purchaser for connecting the load wiring. It would be the bidder's responsibility to prove the adequacy of its design by submitting all technical particulars and relevant graphs to show suitability of charger for supplying load on continuous basis.

The following documents shall be necessarily enclosed along with Tender Submission:

- i) General Arrangement and cross sectional drawing showing device positions, dimensional details and erection arrangement of Charger.
- ii) Schematic diagram of charger showing different components
- iii) Wiring diagram of the charger including ferrule numbering
- iv) Operation & maintenance manuals
- v) Type test report.

n) All Deviations from this specification shall be set out by the bidder and should be brought out clearly in the Deviation sheet.

5.4 Method of cooling of charger equipment shall be specified by the bidder.

6.0 Technical Particulars of Matching Lead Acid Cell Battery for 30 V, 100 AH

6.1 Standard rating

15 nos. 2 volts, 100AH at 27 Deg C when discharged at 10 hours with final cell voltage not less than 1.85 Volts.

**Range of charging Current and Final Cell voltage**

- a) Range of Float Charging : 80mA to 240mA
- b) Range of Boost charging
- i) Starting Current : 14 Amp
- ii) Finished rate : 7 Amp.
- c) **Cell voltage at the end of charge**
- i) Float charge condition : 2.25 V per cell
- ii) Boost Charge condition : 2.6 V (normal) and 2.75V (Equalising) per cell
- d) **Permissible cell voltage at the end of discharge** : 1.85V

6.2 Ampere Hour capability of each cell of Battery

Amp-Hour Capacity	100AH
Discharge duration	10H
Final Voltage	1.85V

7.0 Nameplate Information

Battery Charger nameplate information shall be determined in agreement with the Employer. This information may include for example:

- Name of manufacturer and country
- Type, design, and serial number
- Rated frequency
- Rated Output Voltage and Current
- Purchase Order number and date
- Month and year of supply
- Property label: 'Property of WBSEDCL'
- Guarantee : Five years

8.0 Type Tests:-

The following tests shall constitute the type tests as per IS: 3136-1965 and IS:4540-1968 (latest amended):

- a) DC voltage current test.
- b) Automatic voltage regulator operation.
- c) Efficiency test.
- d) Ripple Voltage test.
- e) High Voltage test.



September'2024

f) Temperature rise test.

9.0 List of Routine Tests as follows:-

- Physical checking of charger as per approved drawing.
- Insulation resistance test.
- High voltage test (2.0 KV).
- Line regulation test at No Load and full load in test at load in Float/ boost mode.
- Full load ripple content measurement test at load terminals in float and boost mode.
- Voltage regulation test at load terminal and Battery terminals in float and boost mode.
- DC short circuit test without blowing HRC fuses and without tripping MCBs at load terminal and also at Battery charger output terminals with observation of total current limit.
- Checking of automatic operation Float to Boost, Boost to float mode as per Battery condition.
- Checking of Battery voltage, load voltage and Load current Boost Mode at different charging current.
- Checking of battery & Load Terminal voltage in float and boost mode Checking of automatic connection of Battery to load in case of 'Mains Failure' or Charger Trip' conditions.
- Checking of Float voltage setting range and Boost current setting Range in Automatic Mode.
- Any other routine test shall be carried as per IS: 4540 on the complete battery Charging equipment.

9.1 For acceptance of lot, all above routine tests shall be carried out.

10.0 Testing Facilities:

The Bidder must clearly indicate what testing facilities are available in the works of manufacture and whether the facilities are adequate to carry out all Routine, Acceptance Tests. These facilities should be available to WBSEDCL's Engineers, if deputed to carry out or witness the tests in the manufacture's works. If any of the tests can not be carried out in the manufacturer works, Bidder shall have to arrange



for such testing at any NABL Accredited/ Govt. Test House or Laboratory at Bidder's cost.

11.0 Inspection :

All tests and inspection shall be made at the place of manufacturer unless otherwise specially agreed upon by the manufacturer and WBSEDCL. The manufacturer shall provide the WBSEDCL all reasonable facilities, without charge to satisfy him that the material is being supplied in accordance with this specification.

12.0 Tests:-

General: The equipment including all components and accessories shall be subjected to all type of tests including Routine and acceptance tests in accordance with provision contained in relevant standard.

12.1 Type Test: The Bidder shall have to submit along with their Tender documents, as pre-requisites, the complete Type test Reports as stipulated as per Clause No.8.0 of the specification, carried out within 5 years from the due date of Tender, from CPRI/NABL accredited/Govt. recognised Test House or Laboratory on the offered Item, failing which their offer may not be technically acceptable. However, in case of failure to submit the same, submission of type test report on 20.5 Amp Manual & Automatic Float-cum-Boost Battery Charger during submission of Tender is essential.

If the Tenderer fails to produce the said type test report on the offered item during submission of tender, he will have to submit the said type test report before opening of price bid at his own cost.

12.2 Routine and acceptance Tests: Routine & acceptance tests shall have to be carried out in compliance with provision contained in the relevant standard and / or to ascertain satisfactory performance of the offered device at the works of the Manufacturer.

The acceptance tests shall have to be conducted in the presence of authorised representative of the WBSEDCL before effecting delivery.

13.0 Drawings:

The successful bidder shall have to submit the 6(six) copies of drawings, manuals, literatures for approval to the office of the Chief Engineer (P & E) for approval before starting manufacture of the equipment. It is desired that the complete schematic of the charger is provided on a permanently laminated/engraved plate of suitable thickness which has to be bolted/riveted at the four corners on the inside



face of rear door. In addition, one more plate of similar type and dimension shall be provided on the outside of the rear door providing guidelines and instructions for operation of the charger. The guidelines and schematic to be provided on the plates shall be as per approved drawings.

Before despatch of the equipment, 6(six) copies of drawings, manual and literature shall be submitted to WBSEDCL for distribution to different offices of the Company. In addition to above, every crate of complete set of equipment shall also contain in waterproof folder, 1(one) set of drawing, manuals and literature for commissioning, operation and maintenance at site.

14.0 PERFORMANCE GUARANTEE:

Battery Chargers shall be delivered to the various consignees of WBSEDCL and shall be suitably packed to avoid damages during transit. The Battery Charger with all its integral part will be guaranteed for the period of 5 years from the date of last dispatch.

In the event of any defect in any integral part of the equipment arising out of faulty design, materials, and workmanship within the above period, the supplier shall guarantee to replace or repair the same to the satisfaction of the WBSEDCL. However, any engineering error, omission, wrong provision, etc. which do not have any effect on the time period, shall be attended to as and when observed/pointed out without any price implication.

15.0 GUARANTEED TECHNICAL PARTICULARS:

The bidder should fill up the details in schedule A - 'Guaranteed Technical Particulars' and the statement such as "as per drawing enclosed", "as per WBSEDCL requirement", "as per IS", "as per specification" etc. shall be considered as details not furnished and such offers will be rejected.

16.0 Schedules:

The Bidder shall fill in the following schedules, which is part and parcel of the tender specification and offer. If the schedules are not submitted duly filled in with the offer, the offer shall be liable for rejection.

17.0 QUALITY ASSURANCE PLAN:



Schedule-A Guaranteed Technical Particular

17.1. Immediately on receipt of this order you shall have to submit a "Quality Assurance Plan" indicating the specific quality control procedure and practices adopted in the major activities of production to ensure its standard.

17.2 The successful Bidder shall within 30 days of placement of order, submit following information to the purchasers.

(i) List of raw material as well as bought out accessories and the names of sub suppliers selected from those furnished along with offer.

(ii) Type test certificates of the raw material and bought out accessories.

(iii) Quality Assurance Plan (QAP) with hold points for purchaser's inspection. The quality assurance plan and purchaser's hold points shall be discussed between the purchaser and supplier, before the QAP is finalized.

17.3 The successful Bidder shall submit the routine test certificates of bought out accessories and central excise passes for raw material at the time of routine testing of the fully assembled equipment.

**Schedule 'A'****GUARANTEED TECHNICAL PARTICULARS OF 30V, 50A (25A + 25A) FLOAT AND AUTOMATIC FLOAT-CUM-BOOST BATTERY CHARGER SUITABLE FOR 30 VOLT 100 AH LEAD ACID PLANTE TYPE BATTERY.**

Sl. No.	Description	Particulars
1	Name of manufacturer	
2	Type of charger	
3	Indicate specification to which the offered charger conforms	
4	Rated Input supply voltage	
5	Rated Input current	
	Input Power Factor	
6	Output voltage with range of variation	
7	Output current range	
8	Output current a) Max. Battery charging current b) Max. continuous DC external load current c) Max. continuous output current	
9	Output voltage Regulation a) No load b) Full load	
10	Ripple factor	
11	Efficiency	
12	Method of Cooling	
13	Painting details Paint shed Paint thickness	
14.	Material of enclosure	
15	Degree of Protection of enclosure	
16	Whether Backside Cover will be double door type(Yes/No)	
17	Whether stud type separate terminals of Minimum 75 A rated for connecting load and charger leads to the battery terminals has been provided.	
18	Provision of LEDs for indication purpose	



19	Provision of Audio/ Visual alarm	
20	Provision of labels for individual components	
21	Provision of ferrules	
22	Provision of separate terminals for connecting battery and load	
23	Provision of two separate Earthing terminals	
24	Weight of the complete charger	
25	Overall dimensions of Battery Charger(HxWxD)	
26	Thickness of the sheet enclosure (Load Bearing Member and Non-Load Bearing Member)	
27	Make and rating of Miniature Circuit Breaker for AC Input supply	
28	Make & rating of main transformer 1) For Float section. 2) For Float cum Boost Section.	
29	Make and type of rectifier SCR	
30	Rating of rectifier SCR in Amps	
31	PIV value of rectifier diode	
32	Output in Amps of complete rectifier stack	
33	Make, Type & range of Voltmeter	
34	Expected service life of Charger	
35	Commitment for availability of spares during service life	
36	Applicable Standards	
37	List of accessories to be provided with the Charger	
38	Recommended particulars of matching Battery	
39	Technical particulars of different components including make, type and rating	
40	Description of operating principle of Auto/Manual float cum boost charger with functions of different components supported by drawing and block diagram	
41	Guarantee	

Place:

Name of the Company:

Signature with Date:

Name & Designation:

Seal of the Company: