

**General Specification of float cum boost battery charger 110V/25A suitable for 110 Volt/100Ah battery bank.****1. Scope**

Supply, installation, testing and commissioning of **110V DC, 25A Float-cum-Boost Battery Charger** suitable for charging and maintaining a **110V, 100Ah battery bank** for control, protection, relay and switchgear applications in substations, HT switchboards, RMUs, VCB panels and Railway electrical installations.

The charger shall be complete with:

- Float-cum-Boost charger
  - Input and output protection
  - Digital metering
  - Alarm and annunciation system
  - Battery charging control system
  - DC distribution arrangement
  - All accessories required for satisfactory operation
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**2. Applicable Standards**

The charger shall conform to IS 15549 or latest.

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**3. System Parameters**

Particular	Requirement
Input Supply	415V AC $\pm 10\%$ , 3 Phase, 4 Wire
Frequency	50 Hz $\pm 5\%$
Output Voltage	110V DC
Rated Current	25A
Battery Bank	110V, 100Ah
Charger Type	Float-cum-Boost
Cooling	Natural / Forced Air
Duty	Continuous Duty
Efficiency	$\geq 90\%$
Ripple Content	$\leq 2\%$ RMS

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## 4. Charger Construction

### Enclosure

- Indoor floor/wall mounted type
- Sheet steel CRCA construction
- Powder coated finish
- Front access operation
- Degree of Protection: IP42 minimum or as per site requirement.

### Internal Arrangement

Separate compartments for:

- Input MCCB
  - Rectifier section
  - Control section
  - Metering section
  - Output section
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## 5. Rectifier Unit

### Technology

- Fully controlled SCR based rectifier or
- IGBT/SMPS based industrial charger

### Features

- Automatic float charging
  - Automatic boost charging
  - Current limiting
  - Voltage regulation
  - Soft start facility
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## 6. Float Charging Mode

Parameter	Value
Float Voltage	121V to 123V DC (adjustable)
Regulation Accuracy	±1%
Continuous Operation	Yes

The charger shall continuously maintain the battery in fully charged condition.

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## 7. Boost Charging Mode

Parameter	Value
Boost Voltage	132V to 137V DC (adjustable)
Charging Current	Limited to rated charger current
Auto/Manual Selection	Available

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## 8. Output Characteristics

### Voltage Regulation

- Better than  $\pm 1\%$  from no load to full load.

### Current Regulation

- Better than  $\pm 2\%$ .

### Ripple

- Less than 2% RMS.
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## 9. Metering & Indications

### Digital Meters

#### Input Side

- AC Voltmeter
- AC Ammeter

#### Output Side

- DC Voltmeter
- DC Ammeter

### LED Indications

- AC Supply Healthy
  - Charger ON
  - Float Mode
  - Boost Mode
  - DC Healthy
  - Battery Connected
  - Charger Fault
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## 10. Protection Features

The charger shall be provided with:

### AC Side Protection

- Input MCCB
- Short Circuit Protection
- Overload Protection
- Single Phasing Protection

### DC Side Protection

- Output MCCB/MCB
- Reverse Polarity Protection
- Over Voltage Protection
- Current Limiting
- Short Circuit Protection

### Battery Protection

- Deep Discharge Protection
  - Reverse Current Blocking
  - Battery Isolation Facility
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## 11. Alarm & Annunciation

Audio-visual alarm with potential free contacts for remote monitoring.

### Alarms

- AC Failure
  - DC Failure
  - Charger Failure
  - High DC Voltage
  - Low DC Voltage
  - Battery Disconnected
  - Fuse Failure
  - Rectifier Failure
  - Earth Fault (Optional)
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## 12. Battery Compatibility

Suitable for charging:

- 110V, 100Ah VRLA Battery Bank
- 110V, 100Ah SMF Battery Bank
- 110V, 100Ah Ni-Cd Battery Bank

Number of cells as applicable to battery technology.

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## **13. Communication (Optional)**

### **SCADA Interface**

- RS485 Port
- Modbus RTU
- Ethernet (Optional)

Available Parameters:

- DC Voltage
  - DC Current
  - Charger Status
  - Battery Status
  - Alarm Status
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## **14. Routine Tests**

The following tests shall be conducted at manufacturer's works:

- Visual Inspection
  - Functional Test
  - Voltage Regulation Test
  - Current Regulation Test
  - Ripple Measurement
  - Insulation Resistance Test
  - High Voltage Test
  - Protection Verification
  - Alarm Verification
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## **15. Site Testing & Commissioning**

The scope shall include:

- Installation
  - Interconnection with battery bank
  - Polarity checks
  - Float charging test
  - Boost charging test
  - Alarm testing
  - Load test
  - Functional testing
  - Commissioning
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## 16. Technical Data Sheet

Parameter	Requirement
Charger Type	Float-cum-Boost
Input Voltage	415V AC, 3 Phase
Output Voltage	110V DC
Rated Output Current	25A
Battery Bank	110V, 100Ah
Voltage Regulation	±1%
Current Regulation	±2%
Ripple	≤2% RMS
Cooling	Air Cooled
Protection	IP42 Minimum
Communication	RS485 Modbus (Optional)

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### Warranty

The equipment must be guaranteed for satisfactory operation for a period 30 months from date of supply and 24 month from date of installation whichever is earlier. The equipment found defective/failed within the above warranty period shall be replaced or repaired by the firm free of cost within stipulated time specified by higher authority from Railway.

### Drawings, Data and Manuals

General Arrangement Drawing, Foundation Drawing, Structural Drawing or any other required drawing must be got approved by Sr. DEE/G/ASN or AEE/G/ASN before inspection & supply of items. These Drawings should have proper spaces for signature of checking authority & approval authority. Any other relevant documents, instruction manual, specifications or data necessary for satisfactory installation, operation and maintenance to be submitted as & when required.

### Inspection

1. Supply items ( likes P&M items, Luminaries and any special items included in LOA having bid value more than Rs. 5,00,000/- should be inspected / tested by RITES (as per Railway Board's Circular) with firm cost at manufacturer's premises / site as decided by Railway.
2. Material supplied should be as per the description, scope and specification in the tender document. Contractor will intimate in advance for readiness of materials for inspection.
3. Manufacturers test certificates for the different test carried out should be submitted by the tenderer.

**The decision of Railway Administration for inspection of supply items by RITES / Consignee by firm own cost over the matter will be final.**

**TEST REPORTS:** Agree to provide all relevant documents Test Report / supporting document /reports etc. ( from authorized government designated agency) to the buyer at the time of bidding or on demand.

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**DOCUMENTATION:**

Detailed technical manuals, handbooks, warranty card and factory quality assurance checklist, test results and any other certifications, if any, shall be supplied along with the consignment.

Supplied manuals/handbooks must cover detailed technical specifications and installation, operation, maintenance and system safety procedures.

The receipts for taxes paid, if any, for the supplied equipment should also be submitted.

Any other relevant documents, instruction manual, specifications or data necessary for satisfactory installation, operation and maintenance to be submitted as & when required.

The description of scheduled item is indicative. Entire Electrical Work is to be done in line of relevant RDSO's or IS or PCEE/ER's specification & design, **Electrical General Service Manual ,Volume-I (Power Supply) & latest** or OEM Standardisation or equivalent international standard for detail technical specification and all other clauses, terms & conditions for design, manufacture, testing, supply, installation and commissioning followed by statutory rules and common prudence and shall confirm to the rules & regulations of Railways.**The decision of Railway Administration over the standardisation & make for execution of the work will be final.**

The eligible contractor must furnish the detail of material which is proposed to be supplied or used inevitably got approved from Sr.DEE(G)/ASN or Sr.SE/Elect/G- the Supervision-in-charge of the work or authorized representative of Sr. SE/Elect/G before commencement of work. Decision of Railway administration over the standardisation& make of all the material for the items of work schedule will be final.

**PUBLIC PROCUREMENT POLICY (MAKE IN INDIA):**Bidder must follow Public Procurement Policy (Make in India) Order 2017, dated 15/06/2017, issued by Department of Industrial Promotion and Policy, Ministry of Commerce, circulated vide Railway Board letter no. 2015/RS(G)/779/5 dated 03/08/2017 and 27/12/2017.The definition and calculation of local content in accordance with the Make in India policy as approved by PCEE/ER is 50% of Minimum Local Content (MLC).

**NOTE:-**

These technical details / general specifications are indicative only. In case of any ambiguity in the General specification or Technical Details it may be collected from Sr. DEE (G)/Asansol's office if required. All items pertaining to Electrical should confirm to relevant IS or equivalent international standard. Any deviation must be got approved by Sr.DEE/G/ASN.

Any typographical error shall not be construed to be benefit of the Contractor; In all cases the interpretation and decision of Sr.DEE/G/ASN shall be final and binding upon the contractor.

The issues not covered under these tender documents shall be governed by General Conditions of Contract April-2022 or its time to time latest amendments if any.

**Sr. Divl. Electrical Engineer (Genl.)  
Eastern Railway, Asansol**