

Supply, installation, testing & commissioning of battery chargers with battery banks of 110 volts DC as per scope of supply and work mentioned below:

**1. Supply of Float Cum Boost charger with 110 Volts Battery bank: Qty: (03 Nos)**

**1(A) Float charger:**

- |     |                       |   |
|-----|-----------------------|---|
| 1.0 | Input Power Supply    | : 220 Volts $\pm 10\%$ , Single Phase / 415 Volts $\pm 10\%$ 3 Phase, 50HZ  |
| 2.0 | Output Voltage        | : 110 volt (2.15 Volt per Cell)   |
| 3.0 | Output Current        | : 30 Amps. DC Continuous  |
| 4.0 | Mode of Operation     | : Automatic / Manual  |
| 5.0 | Output Ripple         | : Within 2% rms at full load of 115 Volts DC without battery connected.   |
| 6.0 | Output Regulation     | : Within $\pm 1\%$ for $\pm 10\%$ supply voltage fluctuation and 100% load variation.   |
| 7.0 | Control Configuration | : 1-Phase / 3 Phase full wave thyristor / IGBT bridge fed thru 1-phase / three phase transformer and controlled by constant current controller unit with load limiting feature. |

**1(B) Float cum boost charger:**

- |     |                       |  |
|-----|-----------------------|--|
| 1.0 | Input Power Supply    | : 220 Volts $\pm 10\%$ , Single Phase / 415 Volts $\pm 10\%$ 3 Phase, 50HZ.  |
| 2.0 | Output Current        | : 30 Amp. DC Continuous  |
| 3.0 | Boost Mode            |  |
| a)  | Starting rate         | : 18 Amps up to 2.35 Volt per cell   |
| b)  | Finishing rate        | : 9 Amps up to 2.75 Volt per cell  |
| 4.0 | Mode of Operation     | : Automatic / Manual   |
| 5.0 | Output Ripple         | : Within 2% rms at full load of 115 Volts DC without battery connected.  |
| 6.0 | Control Configuration | : 1-Phase / 3 Phase full wave thyristor / IGBT bridge fed through 1-phase / three phase transformer and controlled by constant current controller unit with load limiting feature. |

7.0 **Ammeter:** Output Current

8.0 **Voltmeter:** Main Supply Voltage & Out-put Voltage (Float, Boost, Load & Battery).

9.0 **Alarm Module:** Alarm for all abnormal conditions in the system.

10.0 The Float charger mentioned at '1(A)' above and the Float cum Boost charger mentioned at '1(B)' above, shall act as redundant to each other. In case of failure of one unit, the other shall change over automatically. The faulty charger shall display 'Alarm' condition, in this case.


11.0 Both the chargers mentioned at '1A' and '1B' above shall have integrated digital status indicator, showing Battery Voltage and Discharge current of the battery bank.

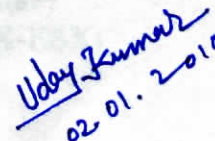
**11.0 Voltage Regulation**

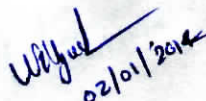
a) The float charger shall have both auto and manual voltage regulation arrangements with provision of selector switch. Output DC voltage shall not vary beyond  $\pm 1\%$  of the set value when controlled through AVR with load varying from no load to full load simultaneously with specified fluctuations in input voltage and frequency.

**1(C) The battery charger shall also have the following features:** 1. Indications : Input supply ON, Float ON, Boost ON, DC Over Current, Charger Failure, Input & Output Fuse Fail, Filter capacitor fuse fail and DC Under & Over Voltage.

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**1(D) Integrated DCDB comprising:**

1. Incoming Feeder	: 200 Amps, 2 pole MCCB	--- 01 no.
2. Outgoing Feeders	(a) 100 Amp, 2 Pole MCB/MCCB	--- 01 no.
	(b) 63 Amp, 2 Pole MCB	--- 04 no.
	(c) 32 Amp, 2 Pole MCB	--- 03 no.
	(d) 20 Amp, 2 Pole MCB	--- 03 no.

(Make: HBL/Amara raja/chhabi/sevilinear/statcon/chloride/Danish/Dubas/Signotron/Ascon Control).

**1(E) 110 Volts Battery Bank:**

Lead acid PLANTE / Tubular cells each of 2 - 2.25 volts, 150-200 AH capacity (Make: Exide/ HBL/Amararaja/Amco/Hoppercke/Kirloskar/RICO), suitable for protection & control 11 KV switch gears system.  
(Each Set having 55 Cells)

**2. Installation, Testing & Commissioning of supplied battery chargers & battery banks:**

Following works shall be undertaken by party:

1. Installation, testing & commissioning of new Battery Charger with Battery Bank at 03 different locations (CDS, DS1 & DS2 Substation) in BHEL, HEPP, Hardwar. All materials required for installation, testing & commissioning of all 03 sets shall be supplied by party like: stands for placing the batteries, support insulators, electrolyte, inter connecting links for cells, hydrometer, voltmeter etc.

Note: Party have to quote separately for

1. Supply of Battery Charger with Battery Bank with taxes and duties (03 Nos).
2. Installation, testing & commission of 03 sets of battery charger with battery bank.

**3. Guaranty:** Party shall stand warrantee for 12 months from the date of successful commissioning of the system for all material supplied and all services rendered.

**4. Acceptance:** The completed system shall be inspected for proper operation at BHEL after commissioning.

**5. Documents:**

Party shall submit three sets of relevant documents for supplied charger and battery bank including:

- 5.1. List of spares along with name and address of the manufacturers.
- 5.2. Electrical circuit diagram of the supplied battery charger.
- 5.3. Catalogues & other required documents for batteries.

**6. General:**

6.1. Any material/s required for commissioning of all three battery bank with battery charger, other than those mentioned above, shall be supplied by party without any extra cost.

Manager (ESX)

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02/01/14

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