

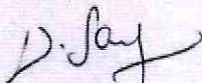
BHARAT HEAVY ELECTRICALS LIMITED

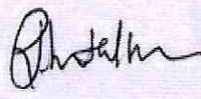
TIRUCHIRAPALLI-620 014

Ref: BHEL/NGA/DCFC/ 001



**Document for procurement of one 50 - 60 kW and one 120 - 150 kW DC Fast
charger for charging the Li-Ion Battery of Electric Bus**


Prepared by


Checked by


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1.0 **Brief scope of the Work**

Supply of one **50 – 60 kW** and one **120 - 150 kW** of CCS-combo 2 and GB/T multi-standard, floor mounted EV Off-Board DC Fast chargers for Electric buses, packing and forwarding, transportation, installation and commissioning and successful testing with training of charging station as per BHEL's specification (**Refer annexure 1**). The charger must meet all safety requirements as per the applicable National/International standards.

The scope of the work includes:

1. Supply of one 50-60 kW DC fast charger of CCS-combo 2 and GB/T multi-standard
2. Installation and commissioning of the charger -50-60 kW DC fast charger
3. Supply of one 120-150 kW DC fast charger of CCS-combo 2 and GB/T multi-standard
4. Installation and commissioning of the charger -120-150 kW DC fast charger
(Note: Necessary civil works for installation will be carried out by BHEL and supervision needs to be provided by the bidder)
5. **Supply of input cable from Distribution box to Charger (rate per metre length shall quote separately)**

The charging infrastructure must comply with all norms, standards and regulations applicable and must be described by the supplier in detail.

Note: Price shall be quoted separately for each of the above activities

2.0 **Pre-Qualification Requirements**

Sl.No	Pre-Qualification Requirements	Bidder Confirmation to the points above	Documents to be attached	Bidder Remarks
1. (A)	<u>Indian OEM</u> The bidder shall be India based Original Equipment Manufacturer (OEM) of DC Charger Equipment.	Yes/No	Certificate of incorporation along with Article of association and memorandum of association.	

B)	<u>Non-Indian OEM</u> OEMs based outside India, who are making offer for this tender shall have authorized representatives in India for extending needed support related to product documentation, erection, commissioning, after sales service, spares & any other co-ordination work. Such OEM's shall indicate and furnish proof for the type, duration & validity of the agreement. The Indian representatives should have the team of experienced service engineers on payroll located at various parts of India. OEM shall furnish an undertaking that in case of change in Indian representatives/agent, OEM shall continue to support supplies w.r.t to field service and supply of spare parts.	Yes/No	Furnish proof for all the documents required against non-Indian OEM	
2.	The bidder should have designed, engineered, manufactured, type tested, supplied and commissioned or supervised commissioning of DC Charger system for Electric vehicle application of capacity not less than 50 kW. The Reference List of DC Charger supplies made so far giving the ratings, year of supply, application, details of the customers, PO references, etc. to be provided along with the offer.	Yes/No	Reference list of all supplies made till date	
3.	The bidder shall undertake to extend AMC or provide service support for the equipment supplied, after the expiry of the warranty / guarantee period either directly or through a service representative.	Yes/No	Name and registered address of the Indian branch office or Indian representative for support of E&C and after sales service	

			with organisation chart	
4.	Bidder should have ISO:9001 certificate or equivalent.	Yes/No	ISO 9001 certificate or higher	
5.	Bidder should have at least 2 years' experience in the business of manufacturing, sales and service of electrical/power electronics equipment including battery chargers, storage and AC to DC & DC to DC Converters.	Yes/No	Should furnish suitable supporting documents	
6.	The bidder should have obtained necessary certification for the Charger from ARAI or equivalent approving authority either in India or outside.	Yes/No	Certificate	

Note: a. The Pre-Qualification criteria are mandatory requirements and the technical bids will be evaluated only when the Pre-Qualification criteria are met.

b. Bidder must furnish all necessary supporting documents, as required, along with the bid to satisfy Pre-Qualification criteria as specified above.

3.0 Quality Control and Inspection

- a) The bidder shall be wholly responsible for the quality and performance of the supplied charging equipment as per the tendered technical specifications.
- b) BHEL reserves the right to visit the manufacturing site or the supply chain for quality inspection at any time. BHEL at its discretion may order the testing of random samples either at the implementation partner's premises (if an ARAI-accredited Testing Laboratory is available) or at any other third-party ARAI-accredited laboratory.
- c) All tests shall be carried out as per AIS 138, and the bidder shall submit the relevant test reports.
- d) After testing, if the charging equipment are found not matching the specifications at given test parameters, BHEL at its discretion may order for cancellation of complete order or cancellation of the complete lot of product. The complete loss shall be to the account of the bidder.

Pre-Dispatch Inspection

The chargers ordered on the bidder shall be subjected to inspection, check and/or test by the BHEL or its authorized representative at all stages and place, before, during and after the manufacture, prior to the dispatch.

The bidder shall maintain and provide statutory test certificates for each supplied charger, confirming compliance to the technical specifications and other tender requirements. The Test Certificate needs to be transmitted electronically to BHEL at least 48 hours in advance of pre-dispatch inspection date. Only those chargers meeting compliance shall be dispatched by the bidder.

If upon delivery, the material/equipment does not meet the specifications, say, due to subsequent shipping damage, product mix-up, the material/equipment shall be liable for rejection and returned to the bidder for repairs / modification, etc. or for replacement. In such cases, all expenses including the to-and-fro freight, repacking charges, any other costs, etc. shall be to the account of the bidder. The bidder shall arrange removal of the rejected items within 15 days from the date of notification. In the event the bidder fails to lift the material in 15 days, BHEL is at liberty to dispose the rejected items in any manner as it may deem fit.

Quality Plan

The bidder shall submit the Bidder Quality Plan (BQP). The submitted BQP will be approved by BHEL upon placement of purchase order only after which the bidder should proceed with the supply related activities.

4.0 Packing procedure

The items should be supplied in proper weather proof, transit worthy packing to avoid any damage during transit, storage and delivery. The bidder shall be responsible for the safe transport of the equipment till their delivery at BHEL Trichy stores.

5.0 Documents required from vendor along with offer:

- a) GA (General arrangement) Drawing and foundation load details
- b) GA drawing of all electrical components in EV charger (clearly indicating civil foundation needs etc., if any)
- c) Installation Instructions
- d) Charger performance curve
- e) Electrical input arrangement of charging station
- f) Quantity of any consumable required like cooling water, compressed air etc. to be specified
- g) Technical data sheet for EV charger (as per spec format)
- h) Bidder shall not assume anything under BHEL Scope without mentioning in Scope of supply or exclusions.
- i) Dimensions and weight of each Charger

6.0 Documents to be submitted for approval after ordering:

- a) EV charger circuit design
- b) Technical data sheet of all the power electronic switches and electric components used in charger circuit

- c) Quality plan
- d) Performance test report

7.0 Documentation along with supply of charging equipment

The bidder shall provide the following documents (both hard copy and soft copy) to BHEL for reference:

Manual / Guide: User Manuals, FAQ, OEM Functional Manuals and Installation Guides and Troubleshooting Guides.

Certificates: Equipment Warranty, Insurance, tests, certificates if any.

8.0 Installation and Commissioning

All electric equipment and components including the related supplies i.e., cables, glands, fasteners, (including but not limited to) etc. required for Installation and commissioning shall be under bidder's scope. **BHEL will provide the three phase main supply line with distribution box. Input cable from Distribution box to charger and also provide necessary connectors is under bidder scope. Price per metre length of input cable shall be quoted separately. Length of input cable required shall be decided with successful bidder by BHEL.** Commissioning of Charger System at BHEL Trichy place shall be in the scope of Bidder. The civil works shall be in the scope of BHEL with the supervision of bidder.

Final product acceptance shall be based on successful completion of erection and commissioning. Any replacement of failed/damaged items during commissioning shall be exclusively at Bidder's cost. Bidder is advised to stock necessary spares and ensure easy availability to facilitate trouble free commissioning. The Bidder is expected to work with project managers from communication/system integrator/ utilities for resolving the following risks (non-exhaustive indicative list): poor equipment performance, project scope creep, unavailability of internal and external sources, Rectification of equipment faults.

9.0 Delivery Schedule

Sl. No	Milestone	Duration
1.	Supply of one DC Fast charger of 50-60 kW and one DC Fast Charger of 120-150 kW- receipt at BHEL stores	45 days from the date of PO
2.	Installation and Commissioning	20 days from the date of clearance by BHEL against milestone 1

Annexure 1

Technical Specification for EV Charging station to charge the battery of Electric Bus

Sl.No	Parameter	Charger 1	Vendor Compliance for Charger 1	Charger 2	Vendor Compliance for Charger 2
1	Output Capacity	50 - 60 kW		120 - 150 kW	
2	Regulation Method	Regulated DC EV charging station with combination of CVC or CCC but not simultaneously		Regulated DC EV charging station with combination of CVC or CCC but not simultaneously	
3	Input AC supply system	3 phase, 5 wire AC system(3ph+N+E)		3 phase, 5 wire AC system(3ph+N+E)	
4	Input Voltage	Nominal Input Voltage 415V (+6% and -10%) as per IS 12360		Nominal Input Voltage 415V (+6% and -10%) as per IS 12360	
5	Input Frequency	50 Hz		50 Hz	
6	Output DC Voltage	200-750 VDC		300-750 VDC	
7	Output DC Current	80 - 90 Amps max.		170 - 220 Amps max.	
8	Ingress Protection	Minimum IP55		Minimum IP55	
9	Power Factor	> 0.96		> 0.96	
10	THD	≤5%		≤5%	
11	Efficiency	>95% at nominal output power		>95% at nominal output power	
12	Charging cable length	5m		5m	
13	Number of connectors/gun	2		2	
14	Connector/socket type	CCS2 (Combo 2) and GB/T multi-standard As per IEC 62196 standards		CCS2 (Combo 2) and GB/T multi-standard As per IEC 62196 standards	
15	Insulation (input – output)	As per IEC 61851-21,23,24		As per IEC 61851-21,23,24	

16	Operating temperature	0 °C to 55 °C		0 °C to 55 °C	
17	Working humidity	≤ 95% RH		≤ 95% RH	
18	Ventilation/Cooling system	Forced Air cooling		Forced Air cooling	
19	Display	Minimum 7 inch Touch screen or keypad (backlighted).		Minimum 7 inch Touch screen or keypad (backlighted).	
20	Display Messages	• Vehicle plugged in / Vehicle plugged out • Total time required for charging • Duration since start of charge, • kWh consumed. • User authorization status • Idle / Charging in progress: SOC • Fault conditions • Metering Information: Consumption Units		• Vehicle plugged in / Vehicle plugged out • Total time required for charging • Duration since start of charge, kWh consumed. • User authorization status • Idle / Charging in progress: SOC • Fault conditions • Metering Information: Consumption Units	
21	Support Language	English		English	
22	User access authorization	RFID system or other equivalent or better system		RFID system or other equivalent or better system	

23	Visual Indicators	Error indication, presence on Input supply indication, state of charge process indication		Error indication, presence on Input supply indication, state of charge process indication	
24	ON-OFF(start-stop) switches	Mandatory		Mandatory	
25	Emergency Stop switch	Simple push button type in Red color, visible and easily accessible		Simple push button type in Red color, visible and easily accessible	
26	Communication between Charger and vehicle	BMS Communication /Compliance standard: CCS (Combo II) and GB/T As per IEC61851- 1/23/24/, ISO 15118		BMS Communication /Compliance standard: CCS (Combo II) and GB/T As per IEC61851- 1/23/24/, ISO 15118	
27	Communication interface between charger and central management system(CMS)	Ethernet, 3G/4G and Wi- Fi Communication protocol: OCPP 1.6 or higher		Ethernet, 3G/4G and Wi-Fi Communication protocol: OCPP 1.6 or higher	
28	Protection	Over current circuit breaker, Under voltage, Over voltage, Surge protection, Short circuit, Faulty Insulation, Isolation, Ground monitoring, communication failure		Over current circuit breaker, Under voltage, Over voltage, Surge protection, Short circuit, Faulty Insulation, Isolation, Ground monitoring, communication failure	
29	Body	ABS/Metal		ABS/Metal	

30	Billing and payment requirement	a) Billing: Based on grid responsive metering b) Payment: BHIM / Bharat QR or UPI compliant mobile payment c) Metering: As per Indian metering standard		Billing: Based on grid responsive metering b) Payment: BHIM / Bharat QR or UPI compliant mobile payment c) Metering: As per Indian metering standard	
31	Warranty	1 year		1 Year	
32	Input cable	Input cable from Distribution box to charger (price per metre length shall be quoted separately)		Input cable from Distribution box to charger (price per metre length shall be quoted separately)	

Abbreviations

ABS	Acrylonitrile Butadiene Styrene
AC	Alternating Current
AIS	Automotive Industry Standards
ARAI	Automotive Research Association of India
AMC	Annual Maintenance Contract
BHEL	Bharat Heavy Electricals Limited
BMS	Battery Management System
CCC	Constant Current Charging
CCS	Combined Charging System
CVC	Constant Voltage Charging
CIRT	Central Institute of Road Transport
CMVR	Central Motor Vehicle Rules
DC	Direct Current
EMC	Electro Magnetic Compatibility
EV	Electric Vehicle

FAQ	Frequently Asked Questions
IEC	International Electrotechnical Commission
IP	Ingress Protection
ISO	International Organization for Standardization
OCPP	Open Charge Point Protocol
OEM	Original Equipment Manufacturer
RFID	Radio-Frequency Identification
RH	Relative Humidity
THD	Total Harmonic Distortion