

## Technical Specifications for Supply, Installation and Commissioning of Regenerative Dynamic Battery Emulator System

Sl. No.	Specifications
1	<b>Applications/End use:</b> To emulate/perform charge-discharge cycle tests of battery modules and packs or other power electronics components for electric vehicle(EV) applications
2	Minimum power rating of the system: 20 kW or higher
3	Number of channels required : 4
4	Minimum power for each channel : 5 kW or higher
5	Voltage Range : At least 2 channels 500V or higher & other channels 200V or higher
6	Voltage resolution: 50 mV or better
7	Voltage Accuracy : 0.2% Full Scale (FS) or better
8	Current ratings: Minimum 20A per channel for 500V channels and Minimum 50A per channel for 200V channels
9	Current resolution: 50mA or better
10	Current Accuracy : 0.2 % FS or better
11	Power resolution: 1 W or better
12	Power accuracy: 0.5% FS or better
13	All the channels must be able to work in source or sink mode. The transition time from source to load and vice versa should be 10 ms or less.
14	System must have modularity for paralleling all the channels or any combination of channels by mix and match to work in source or load mode - within the same unit.
15	The system should be an integrated solution and programmed through one controller
16	The system should be modular for channel paralleling for higher number of channels in one controller for future up gradation in power/currents.
17	The system should provide automatic switching between source and load without any interrupt. There should be no overshoot during the transition
18	The system must be supplied with industrial grade PC with necessary hardware, cables/connectors and interfaces (such as Ethernet, USB etc) and integrated software for measurement, monitoring, display, and data logging.
19	System should be able to perform charge-discharge cycle tests with constant current (CC), constant voltage (CV), constant resistance (CR) & constant power (CP) modes.
20	System should have inbuilt driving cycle simulation facility to simulate real conditions of EV battery pack.
21	The system should have battery pack simulating function to simulate battery pack charging/discharging, battery behavior curve setting, starting voltage and capacity initializing, battery pack total capacity setting, charging and discharging efficiency setting, battery DC resistance simulation, etc.
22	System should be air-cooled using variable speed fans.
23	The individual channel must have inbuilt protection and safety features for over current, over voltage, battery HV/power Warning, battery LV/Power warning, battery OVP/OPP, Battery HVP/LVP, over charging, over discharging, etc.
24	The system should have data recovery protection in the event of power failure and should continue from the point where power failure occurred on resumption of the power.

25	Regeneration energy discharge efficiency: 80% or higher, Total Harmonic Distortion (THD) $\leq 5\%$ , Power factor (PF) $\geq 0.9$
26	The system cabinet should be roller-wheeled with locking arrangements.
27	Power Supply: Single/Three Phase, AC 220/ 440 V, 50-60Hz
<b>Installation, commissioning and demonstration</b>	
28	The system is required to be installed, commissioned and demonstrated at the buyer's site. Operation and maintenance manuals should be supplied.
<b>Warranty</b>	
29	One year comprehensive onsite warranty (including spares) from the date of installation.
30	Additional two years extended warranty should be quoted separately as optional and this amount <b>will not be considered</b> for evaluation of lowest bidder. However, if opted, the amount of extended warranty will be paid on year-to-year basis.
<b>Qualification Criteria</b>	
31	The bidder should have sold and/or installed at least three multichannel (2 channel or higher) battery testers/cyclers/emulators to any of the leading institutions and national laboratories in India such as IISc/IIT's/CSIR/IISER/NIT/Central Universities/DRDO/DAE/MNRE/ISRO and other Govt. establishments within last 5 years. PO copies (with all annexures) are required to be enclosed along with the technical bid.
32	The bidder, other than OEM, must enclose authorization certificate from the OEM.
33	The OEM/Bidder must enclose proper printed documentary evidence such as datasheet, catalogue, technical brochure etc in support of technical specifications or compliance of the quoted items/product.
<b>Notes</b>	
<ol style="list-style-type: none"> <li>1. The details of service centre locations need to be mentioned in the technical bid.</li> <li>2. The OEM/Bidder should provide the breakup of the items, model number along with full technical specifications etc.</li> </ol>	