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Technical Specification of Multichannel Potentiostat

Configuration Design	<ul style="list-style-type: none">▪ Multichannel Electrochemical Test Station with minimum Two channels or more in a Single Chassis and Upgradation up-to Six Channels or more in the same Chassis▪ Single Chassis with Multichannel Configuration▪ Bi-Potentiostat Ready
General Description	<ul style="list-style-type: none">▪ Multi-channel Electrochemical workstation for Electrochemical Studies with high accuracy @0.1% in current and Voltage in all channels.▪ Electrochemical Impedance Spectroscopy (EIS) in One Channel with Quality Indicator to ensure the reliability of EIS measurements▪ Software Controlled Data Acquisition with Minimum Sampling rate about 200μsec or better.▪ Possibility to Record/Measure and control Ewe (potential difference between Working and reference) and Ewe (potential difference between Counter and Reference) simultaneously in one experiment and in real time in both of the Channels.▪ Floating Mode and Grounded should be available for grounded cell▪ Provision of Validation and Calibration of the channels should be available on site

<p>Specifications for Channels 1 & 2</p>	<ul style="list-style-type: none"> ▪ Cell Connection/Electrode Connections: 2, 3, 4, 5 Terminals (+ ground) or more with atleast 1.5m long Cell cable each ▪ Compliance voltage: 12 V or better per channel ▪ Applied Voltage: ± 10 V or better per channel ▪ Maximum Output Current: ± 500 mA or better at ± 10 V per channel ▪ Current Ranges: ± 10 nA to 500 mA or better ▪ Accuracy of applied and measured current: ± 0.1 % Full scale range or better ▪ Resolution of applied potential: 1μV or better ▪ Voltage accuracy: 0.1 % of Full scale range or better ▪ Measured current resolution: 800 fA on lowest current range ▪ Potentiostat Rise/fall Time: <500nS or better ▪ Electrochemical Impedance Spectroscopy (EIS) in One Channel ▪ EIS Frequency range: 10μHz to 7MHz or better ▪ Impedance accuracy of 1% & 1° at 1Hz ▪ Input Impedance: $1T\Omega$ or better ▪ Bandwidth of electrometer: 8MHz or better ▪ Input bias current: 20pA or better ▪ Cyclic Voltammetry with scan rates 10 mV/Sec to 100V/Sec or better ▪ Interface for connection with PC: Ethernet LAN ▪ Local Area Network to access Multiple Computers ▪ Possibility to upgrade to high current using internal boosters up to 10A and 30 A using external booster
<p>Complete Electrochemistry software</p>	<ul style="list-style-type: none"> ▪ Voltametric techniques: OCV (Open circuit Voltage), CV (Cyclic Voltammetry), CA (Chrono Amperometry), CP (Chrono Potentiometry) ▪ Galvanostatic Charge / Discharge (Including C rate control) with voltage vs. time Graph plots and Voltage vs. Capacity

	<p>plot during Charge/Discharge Cycles for Battery Applications</p> <ul style="list-style-type: none"> ▪ Simultaneous Half-cell voltages EWE (or E+) and ECE (or E-) while the Full cell voltage EWE-CE (or ECELL) ▪ Multigraph window capable of displaying up to 10 graphs within a single window ▪ Customize variables graph plot for each axis ▪ At least 3 limits and 3 recording conditions per sequence/cycle (ability to limit a cycle or changeover to next sequence with Time, Voltage/Current, Charge/Power all simultaneously) Multiple recording conditions · ▪ Industrial CC-CV Method (Constant Current – Constant Voltage) ▪ Current Scan (Current/Galvano Dynamic), Voltage Scan (Potentio Dynamic) Constant Power / Constant Resistance ▪ Columbic Efficiency Determination with fitting tool ▪ Current Interrupt ▪ Multiple loops or cycles for executing repetition of techniques ▪ CE to Ground, WE to Ground connection scheme ▪ Analysis tools like Integral, Circular, or linear fit and Electro chemical EIS -Z fit should be available ▪ Monitoring status of each Channel using Global Table/Summary Table ▪ Provision to connect and control External devices like Furnace, Thermal chambers ▪ Option to update the experimental setting parameters on current running experiment without pausing /stopping the channel/experiment
<p>Electrochemical Impedance Spectroscopy (EIS)</p>	<p>EIS measurements simultaneously on the working and on the counter electrode</p> <p>EIS Software with facility for Equivalent Circuit fitting and simulation. Data presentation: Nyquist, Bode, Admittance, Dielectric, Mott-Schottky, Data analysis: Fit and Simulation, Find circle, Element subtraction, Kramers-Kronig,</p>

	<p>Graphic Representation of Equivalent Circuit with user selectable circuit elements and their values in the circuit</p> <p>Impedance fitting tool with battery diffusion elements available (restricted diffusion, restricted modified diffusion, restricted linear diffusion)</p> <p>The impedance fitting tool should have at least 3 different fitting algorithms</p>
Warranty	<p>One Years Standard Warranty after installation and commissioning</p>
Maintenance	<p>The channels Should be plug & play type and easy to install or to be removed on site</p>
Dummy Cell	<p>Dummy cell to be provided for validation of the channels</p>