INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076.

Ref. PR No.: 1000050102 Rfx. No.:6100002441

Technical Specifications of Grid Emulator (Qty-2)

S.No.	Item Description	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1	Key Functional Features of the main unit	Regenerative grid simulator having functionality of grid simulator and four-quadrant power amplifier, four-quadrant regenerative AC/DC electronic load _ all in one Unit to support PHIL application. Table top design , not more than 3U in size. operation modes as single-phase, three-phase, reversed phase(split phase) and multi-channel. Should have NORMAL, LIST and SWEEP mode function and Each mode can work with Surge and Sag function. Should have facility to simulate an arbitrary waveform output, support CSV file import waveform Master-slave parallel, up to 960 kVA to support Future Upgrade Need.		
2	Harmonics Feature	Harmonic simulation and analysis function up to 50 times, built-in IEC61000-3-2/3-12 or equivalent		
3	Trigger Function	Selectable from Manual, Bus, Trigger1, Trigger2		
4	Compliance Tests	Built-in regulation standards support, such as IEC61000-4-11/4-13/4-14/4-17/4-28/4-29, IEC61000-3-2/3-12 or equivalent. Should have a facility for user-editable.		
5	Interface facilities	Built-in USB/CAN/LAN /Digital IO interface. Support Modbus, LXI, SCPI communication. Front panel USB host port for Quick Data transfer and Logging.		
	Source Mode Specification:			
6	Voltage (AC)	VLN 0～350 V VLL（3phase） 0～606 V VLL（reverse） 0～700 V		

7	Voltage (DC)	0-499V		
8	Current (AC)	RMS（1phase） 90 A Crest Factor - 6 Peak（1phase） 270A RMS (3phase/multichannel/reverse) 30A Peak (3phase/multichannel/reverse) 90 A		
9	Current (DC)	0-30A (multi channel/reverse) 0-90 (single phase)		
10	Power (AC)	Per Phase/Per Channel - 5kVA Max power (reverse phase) - 10kVA Max. Power (1phase/3phase/multichannel - 15kVA		
11	Power (DC)	Per channel - 5kW Max power (reverse phase) - 10kW Max power (single/multichannel phase) - 15kW		
12	Programmable impedance	Resistance Range : 3phase / Multichannel : 0 to 1 ohm Single phase: 0 to 0.333 ohm Reverse Mode: 0 to 2 ohm		
		Inductance-Range : 3phase / Multichannel : 0 to 1000µH Single phase: 0 to 333.333µH Reverse: 0 to 2000µH		
13	Islanding RLC	R-Range : 3phase: 1 to 1000ohm 1phase: 0.333 to 333.333ohm Reverse : 2 to 2000 ohm		
		L range : 3 phase: 1 to 5000mH 1phase: 0.333 to 1666.667mH Reverse: 2 to 10000mH		
		C-Range: 3 phase: 0.001 to 5mF 1 phase: 0.003 to 15mF Reverse: 0.001 to 2.5mF		
14	Output Frequency	16-500Hz (Low) 16-2.4kHz (High) Grid simulator mode - 16-150Hz		
15	Frequency Accuracy (16-500Hz) and Resolution	Low - 0.01% High - 0.1% 0.01Hz resolution		
16	Phase Angle	0-360º with 0.01º resolution		
17	CF measurement	User Adjustable 1 to 5		

	range			
	Load Mode Model Specification :			
18	Input voltage	VLN - 30-350V VLL Three phase - 51.96～606V VLL Reverse phase - 30～700V		
19	Input frequency	16-500Hz		
20	Input current	RMS（1phase） 90 A Crest Factor - 5 Peak（1phase） 270A RMS (3phase/multichannel/reverse) 30A Peak (3phase/multichannel/reverse) 90 A		
21	Input power	Per Phase/Per Channel - 5kVA Max power (reverse phase) - 10kVA Max. Power (1phase/3phase/multichannel - 15kVA		
22	Operating modes (AC mode)	CC, CP, CS, CR, CC+CR, CE-RLC (14 circuit topologies)		
23	Operating modes (DC mode)	CC, CV, CR, CP, CC+CV, CR+CV, CP+CV, CC+CR, CC+CV+CP+CR		
	Voltage stability			
24	Load Regulation ±(%of Output+Offset)	DC, 16Hz～500Hz ＜0.05% + 0.05% F.S. 500.01Hz～2.4kHz - ＜0.05% + (0.1%*kHz) F.S.		
25	Line Regulation ±(%of Output+Offset)	＜0.05% F.S.		
26	Resolution (AC and DC)	10mV , 10mA		
27	DC Output - Temperature coefficient-	＜200ppm/℃ F.S.		
28	AC Output - Temperature coefficient-	＜100ppm/℃ F.S.		
29	Voltage ripple RMS	<0.4V		
30	Dynamic response	200us		
31	Voltage slew rate (Typical)	≥2 V/μs with full-scale programmed voltage step		

	Others Functions			
32	Efficiency	91%		
33	Programming response time	2ms		
34	Protection	OVP, OCP, OPP, OTP, FAN, ECP, Sense, UVP(load), FE(load) Should Support anti-islanding protection test function		
35	Data recording	Should support data recording directly form Main unit, 7 hour of more duration, 100ms or faster interval		
36	Working temp	0-50ºC		
37	Operating Modes	AC, DC, AC+DC, DC+AC, Current-source mode		
38	Waveform & Distortion	LIST/SWEEP/Surge & Sag, harmonic synthesis up to 50th order		
39	Regeneration	High-efficiency power regeneration to grid		
40	Display	LCD Touch screen display, multiple display pattern: waveform graph, histogram, vector diagram and list. 6 or more oscilloscope curves display at the same time		
41	Weight	42kg or less		
42	Warranty	3 years on main unit		
43	Accessories	Fiber optic parallel kit to make a parallel connection between two main units for master Slave operation. Customized Trolley cabinet to mount at least Two Main units with provision for input and output cabling Multicore input power cable for the Main unit		
44	After sale Service / Support	Vendor should have a complete setup and Technically Qualified manpower in the buyer's state to provide on-site service / support. A written confirmation from OEM for the above on OEM letterhead needs to be submitted with the technical compliance document.		
	Terms and Conditions for Bidder :			
45	Technical Compliance Statement	A duly signed separate compliance sheet giving the necessary details for every point mentioned in the technical specifications along with the deviation (if		

		any). This compliance sheet will not be considered as the technical specification of the instrument without the detailed technical specification documents		
46	OEM Authorization	The bidder should submit an Authorization Certificate issued by the Original Equipment Manufacturer (OEM). The certificate must be up-to-date. A letter in the official letterhead of the OEM declaring the bidder as their authorized agency to bid.		
47	Technical Evaluation Demonstration	Once the technical bids are opened, the bidders may be called with sample equipment to IIT Bombay for the in-person demonstration of the equipment with a stamp and authorized signatures of the company. For the demonstrations, the bidders will be informed by email. If a bidder is called for a demonstration but does not come for the same, then the bidder will be disqualified		
48	Delivery and Installation	Satisfactory installation/ commissioning and handover of the equipment should be completed within a week from the date of receipt of the material at the Institute premises or within the time as may be extended by IIT Bombay.		
49	Delivery Timeline	Within 120 days from the date of Issue of the Purchase Order The Successful Bidder should give Order Acceptance Acknowledgement within 7 working days from the Order Received Date.		