



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076.

Ref. PR No. 1000053693

Rfx. No. 6100003000

Technical Specification for 30kW AC/DC Grid Emulator with Electronic Load (Qty-1)

Sr. No	Parameter	Specifications	Technical Compliance (Yes / No)	Additional Information (if any)
1	Rated Power	≥ 30kW AC/DC System should be regenerative and feedback power to the grid.		
2	Input AC voltage	3 x 400Vrms + Neutral + Earth; Range ±15%		
3	Current harmonic Distortion	≤ 2% at rated power		
4	Efficiency	≥ 93%		
4.1	Power Factor	0.98 at rated power		
5	Output side in DC			
a.	Terminals	6 (3 positive + 3 negative)		
b.	Channel Configuration	Unipolar: 3 Channels: 2 Quadrants, independent setpoints per channel 1 Channel: 2 Quadrants, single setpoint Bipolar: 4 Quadrants, two independent setpoints		
c.	Voltage Mode (CV)			
	Output Voltage Range	2Q : 0 to 800V 4Q : 0 to +380V / 0 to -380		
	Set point resolution	≤ 10mV		
	Transient Time	≤ 250μs (10% to 90% at a step to Vrated)		
	Ripple	≤ 2 Vpp		
d.	Current Mode (CC)			
	Output Current Range	DC : ± 44 A per channel		
	Range	0 to ± 110% of Irated		
	Set point Resolution	≤ 10mA		
e.	Power Mode (CP)			
	Output Power Range	0 to ± 110% of Prated		
	Set point Resolution	≤ 1W		
	Setpoint Accuracy	± 0.4% of FS		
f.	Resistance Mode (CR)			
	Range	0.1 to 1000 Ohm		
	Set point Resolution	≤ 0.01 Ohm		

	Setpoint Accuracy	± 0.2% of FS		
6	Output side in AC			
	Terminals	4(3 Phase +1Neutral)		
	Channel Configuration	3 Channel: 4 Quadrants, independent setpoints per phase 1 Channel: 4 Quadrants, single setpoint. Multichannel		
	Range	0 to 295Vrms L-N 0 to 510Vrms L-L		
	THD	≤ 0.2% rated linear load at 230Vrms, 50/60Hz		
	Transient Time	≤ 100µs (10% to 90% of 230Vrms)		
	Harmonics	50th independent harmonics per phase for fundamental frequency upto 5kHz. 21 free programmable frequency and phase from 0.1 to 50 times 29 fixed frequency.		
	Frequency Range	Fundamental: 10Hz to 400Hz Small signal bandwidth up to 5000Hz.		
	Phase Angle Range	0 - 360°, Resolution: 0.01°		
7	Output Side in Electronic Load AC			
	Admissible Voltage Range	35 to 277 Vrms L-N 35 to 480 Vrms L-L		
	Current Range	AC : ≥ 44A per phase		
	Frequency Range	10-400Hz		
	Transient Time	< 100 µs (10% at 90%)		
	Resolution	10mArms		
	Phase Angle	-90 to 90° in Sink / Source , Resolution 0.01°		
	Power Mode (CP)			
	Range	0 to ± 130% of Prated		
	Transient Time	< 100 µs (10% at 90%)		
	Setpoint Resolution	1W, 1VA		
8	Operating Mode			
	DC	Programmable Voltage (CV), Programmable Current (CC), Programmable Power (CP), Programmable Resistance (CR)		
	AC	Programmable Voltage (CV), Programmable Current (CC) , Programmable Power (CP), Programmable Impedance (CZ)		
9	User Interface	7" Touchscreen panel Isolated Digital port: 6 inputs, 4 outputs Isolated Analogue port: 6 inputs , 6 outputs Emergency Stop port: 1 NC Input LAN Ethernet with Open Modbus-TCP protocol for remote control Emergency Stop button.		
10	Software	Graphical User Interface for Windows 7/10.		
11	Future upgradeability	Provision to increase the power level of the system by connecting more units in Series/Parallel using		

		<p>master/slave operation. AC: Parallel DC: Parallel, serial or serial-parallel</p>		
12	Protections	<p>Over voltage, Over current, Overload, Short circuit, Emergency Stop, Wrong Configuration, Watchdog, Heart Beat, Output Contactor, Alarms and Limits are user configurable and can be saved in a password protected EEPROM</p>		
13	Measurement	<p>Grid: Voltage, Current, Power and Frequency, Output: Voltage, Current, Power and Frequency, Heatsink Temperatures and DC Link Voltage.</p>		
14	Isolation	System should be isolated from the Mains grid.		
15	Safety	<p>CE Marking Operation and Safety: IEC 61010-1 EMC: EN-61326-1 or Substantially equivalent</p>		
16	Warranty	One-year warranty.		