

TECHNICAL SPECIFICATION FOR LOAD SIMULATOR

1. Maximum active power (AP) in Three phase configuration ≥ 12 kW
2. Maximum Reactive Power ≥ 2.5 times AP (var)
3. Maximum allowable load terminal voltage > 340 V per phase
4. Single, three-phase or split phase AC load operation should be allowed. Options to simulate unbalanced three phase loads with unbalance in magnitude as well as phase should be feasible.
5. Operating modes = Constant Current (CC), Constant RL (with pf between +/-1), Constant Power, Constant Apparent Power
6. DC loading should also be enabled with constant voltage, constant current, constant power and constant resistance modes of simulation.
7. It should have the capability to operate in all four quadrants. Reverse power flow capability should be there with efficiency in sinking power to be equal to greater than 90%.
8. It should have capability to simulate non linear loads. User defined loading current profile needs to be set and simulated. Specifically, the definition of the waveshape of the current should have the following features
 - a) Options to set different harmonic orders (upto 50th order), magnitude and phase of the harmonic components individually in all 3 phases.
 - b) Data given in excel sheet should be used to create the current waveform with data points of atleast 360 samples per cycle.
 - c) Standard waveshapes such as Sine, clipped sine, notched sine, triangle, stepped. In addition, any arbitrary waveform pattern should be feasible to be simulated.
 - d) The crest factor of the current waveform should be programmable in a range of 1.414 to 4 so that peaky currents corresponding to rectifier loads are feasible.
9. The unit should be capable of simulating preprogrammed sequence of a current pattern wherein each cycles of current waveform can be differing in terms of magnitude, phase and harmonics. Such sequence of preset operation hence should be capable to simulate waveforms corresponding to various transient operations.
10. Accuracy in measurements should conform to the following (Rdg-reading; Rng-range)
 - Voltage (RMS): within +/- 0.1% of (Rdg) + 0.1% of Rng for < 100 Hz
 - +/- 0.2% of (Rdg) + 0.15% of Rng for > 100 Hz
 - +/- 0.1% of (Rdg) + 0.1% of Rng for DC
 - Voltage (peak): within +/- 0.5% of (Rdg) + 0.2% of Rng for < 100 Hz
 - +/- 1% of (Rdg) + 0.4% of Rng for > 100 Hz
 - Frequency: 0.1%
 - Current (rms) : within +/- 0.1% of (Rdg) + 0.1% of Rng for < 100 Hz
 - +/- 0.2% of (Rdg) + 0.2% of Rng for > 100 Hz
 - +/- 0.2% of (Rdg) + 0.1% of Rng for DC
 - Current (peak) : within +/- 0.5% of (Rdg) + 0.2% of Rng for < 100 Hz
 - +/- 1% of (Rdg) + 0.4% of Rng for > 100 Hz
 - Power factor: within +/- 0.25% of Rdg +0.25% of Rng
 - Crest factor: within +/- 0.6% of Rdg + 0.6% of peak reading
 - Phase angle: within +/- 2 degree < 100 Hz

+/- 6 deg <400Hz

+/-15deg<880Hz

11. Resolution in measurements should satisfy
 - Voltage: within 0.005% of Rng
 - Frequency: within 0.01Hz
 - Current: within 0.005% of Rng
 - Power factor: within 0.005% of Rng
 - Crest factor: within 0.005% of Rng
 - Phase angle: 1 deg
12. Resolution of RL loading should be about 1mΩ/1 μH
13. Readback waveform capture: Should capture waveforms of bandwidth from DC upto 50kHz at a sampling rate of atleast 125ksamples/sec or more. The capture should happen for operation from 1 cycle upto atleast 1 minute. The capturing accuracy should be within 0.5 % of Rng with resolution of 0.005% of Rng. Various measurements should be available such as AC/DC voltage, current, true power, power factor, crest factor, energy, phase angle peak Voltage, peak current etc.
14. User interface should be available by means of front touch panel, GUI accessible via personal computer.
15. External communication via Ethernet (LAN)
16. Various internal protection such as over voltage, over current, over power and over temperature. Power on self check should be done. Emergency stop physically and via remote control should be possible. Protection levels should be programable.
17. Input voltage line rms: 380V – 460V, 3 phase, 50 Hz

***Note to Bidder: Technical specification compliance statement (complied / not complied) - to be submitted along with technical bid document)**