TECHNICAL SPECIFICATIONS FOR 10 KVA ON-LINE UPS SYSTEMS

Vendor has to duly fill the Technical Specification, attach their catalogue and mark the model in the catalogue.

S.No	SBI REQUIREMENT		VENDORS OFFER / Confirmation
1.	Technology	a) UPS systems with pulse width modulation (PWM) technology in True On-line Configuration, with double conversion using IGBTs in the Inverter and converter. b) Provision for configuring three or more UPS system in parallel load sharing mode. Maximum six nos UPS system can be connected in parallel configuration in one cluster. c) The requirement is for fully rated capacity of single module in parallel with similar module sharing the load having provision for adding one or two modules of similar units. Paralleling of UPS should be achieved by paralleling the output on the power side using control logic signal bus. Each UPS should be capable of individually starting, running and feeding to the load apart from parallel operation. • Individual battery back up is necessary. • Inverters should be synchronized with common by pass supply if required • can be connected in parallel for forming N + 1 (Configuration)	
2.	Inversion Technique	Adaptive pulse width modulation or sine weighted pulse width modulation with high switching frequency (> 12 KHZ for IGBTs).	
3.	Input Voltage Range	Three Phase 400 Volts $\pm$ 15% There should be input to output Isolation through a inbuilt/ separate Isolation transformer.	
4.	Input frequency	45 Hz to 55 Hz and it should be compatible with D G Set.	

<table>
<tr><td>5.</td><td>Output voltage</td><td colspan="2">220 / 230 V.A.C. ± 1% single phase .</td><td></td></tr>
<tr><td>6.</td><td>Output frequency</td><td colspan="2">50 Hz +/- 4% (Synchronous to mains)
50 Hz +/- 1% (Free running)</td><td></td></tr>
<tr><td>7.</td><td>Power factor</td><td colspan="2">The UPS shall be provided with Auto input P.F. correction system to obtain P.F. 0.95 to unity when the connected load P.F. varies from 0.6 to unity.</td><td></td></tr>
<tr><td>8.</td><td>Total Harmonic Distortion (o/p voltage)</td><td colspan="2">< 4% for non-linear load</td><td></td></tr>
<tr><td>9.</td><td>Total Harmonic Distortion (Input current)</td><td colspan="2">≤ 10% at 50% load.
< 5% at full load.</td><td></td></tr>
<tr><td>10</td><td>Waveform (output)</td><td colspan="2">Sine Wave</td><td></td></tr>
<tr><td rowspan="2">11</td><td rowspan="2">Overload capacity</td><td>110% for 10 minutes</td><td rowspan="2">During the test or actual condition, the load should not get transferred to mains through static switch.</td><td></td></tr>
<tr><td>150% for 1 minute</td><td></td></tr>
<tr><td>12</td><td>Transient response and voltage recovery time for step load</td><td colspan="2">For 100% Step load i.e. from full load to no load and no load to full load :.
Dip < 3%
Peak < 3% with recovery time within 3 cycles to normal output voltage.</td><td></td></tr>
<tr><td>13</td><td>Efficiency: It is the ratio of output power in KW of UPS to the input power to the isolation transformer & UPS with battery disconnected, or, battery charging power added to the output. The overall efficiency is found to be less than</td><td colspan="2"><table><tr><td colspan="3">Minimum overall Efficiency at % load</td></tr><tr><td>At 100% i.e full load</td><td>At 66%</td><td>At 33% load</td></tr><tr><td>90%</td><td>88%</td><td>86%</td></tr></table>Penalty for lower efficiency: If the overall efficiency is found to be less than the Bank’s specified value, the UPS is to be rejected and replacement passing the test to be obtained. No further tolerance is permissible.</td><td></td></tr>
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	the Bank's specified value, the UPS is to be rejected and replacement passing the test to be obtained. No further tolerance is permissible.		
14	Rated KVA	10KVA; The UPS should be capable to deliver rated KVA at 0.8 P.F. i.e 10 KVA UPS should be capable to deliver 8 KW load at 0.8 p.p. (output)	
15	Operating Temperature	should be designed for delivering rated KVA at ambient temperature from 0 to 40 Degree Celsius. It should also be capable to deliver approx. 80% of rated output at 50 degree Celsius ambient temperature.	
16	Relative Humidity	Upto 95% at 35 degree Celsius non-condensing	
17	Noise level	At 1 meter from the UPS. $\leq$ 65 decibels (On demand Proto-type test certificate be submitted).	
18	Charger	Built in IGBT based solid state float-cum-boost charger with automatic boost/trickle charge modes with current limiting features. The charger characteristics shall be such as to match the float/boost charging of the batteries as per battery characteristic, for enhancing the life of batteries. The charger should be designed for 2 hours back up period at rated KVA	
19	Crest factor	$\geq$ 3	
20	Interface facility	The UPS system should have necessary hardware and software with RS-232 port to work on DOS/SCO Unix (open screen) Novell / Network/ Current & advanced	

		window operating system. It should be compatible for connecting to Building Management System. (B) Remote manageability through SNMP facility. There is a facility to monitor and broad cast to server wherever necessary condition such as : i) Power failure, back up time, low battery warming & auto file closure. ii) The software should be capable of automatically closing the files (auto closure feature) in the server so that the data / program files on the server are not lost/ corrupted.	
21.	Remote Indication unit (It may be asked if required at site)	In system/systems Administrator Room with indications like Mains on, Inverter ON / OFF / Faulty / Trip, Battery Low and static by-pass ON. 25 meters inter connecting cable to be included in price quoted.	
22	Protection	a). Isolation – Separate/ In-built isolation transformer shall be provided for isolation transformer for fully isolation from mains and surge / spike suppressors to be incorporated. b). Current limiting protection (Fuse less Electronic). Built in overload / short circuit protection with snubber circuits for current limit. c). Soft start on Inverter and charger arrangement *d). Phase locking mechanism for UPS and mains frequency- for 3 phase output. e). Over voltage / under voltage protection. *f). Short circuit protection through HRC fuses (high speed) for devices such as IGBTs. g). Short circuit / overload protection through MCB / MCCB. h). All other protection systems required for safety of UPS system, such as over temperature protection etc.	

23	*I). Thyristor based Static (Auto) bye-pass switch	Bi-directional with change over time less than 10 milliseconds in free running mode and instantaneous in synchronous mode from Inverter to bye-pass and vice-versa	
	II). Manual by-pass switch	Should be provided.	
24	Indications	a). Mains ON with phase indication for single phase / 3 phase separately for all the phases. b). Inverter ON / OFF / FAULTY / TRIP (Reason) c). Battery Low d). Static by-pass ON e). Over temperature f). Earth Leakage	
25	Alarm	i). Low battery alarm to be provided (ii) % load iii) Failure of invertor iv) mains failure / load on battery alarm to be provided. Both should be audio visual. v) Over temperature alarm in two stages 1st stage : Warning, intermittent audio alarm 2nd stage : Tripping, continuous audio visual and resetable.	
26	Metering	Digital panel Meter or LCD display system to indicate the following i). A.C. voltage : Input/ output ii). A.C. current : Input/output or % load iii). D.C. battery voltage iv). D.C. Charging / discharging current v). Frequency – Input/ Output	
27	Battery set A. SMF Batteries (To be installed in ventilated/ cooled rooms only)	i) Complete with self standing cubicle or cabinet ii) Make like : Exide/ Panasonic, CSB, Numeric/ Amararaja Rocket/ New Max , U-plus , AMCO best, HBL.. (iii) **Note:** Only Valve Regulated Lead Acid (VRLA) type SMF batteries with electrolyte In paste form are acceptable.	

		Any other type including calcium batteries are not acceptable date and year of manufacturing of batteries have to specify alongwith Sr. Nos..	

Minimum VAH required as per above details is as under:

UPS Capacity (KVA)	Backup required	Minimum VAH required
10 KVA	**120 Minutes**	**33216**

Batter Details:

Vendor to specify, the make of battery they propose to use, they have to submit detailed literature of battery and battery manufacturers capability etc.

Sr No.	UPS Rating	DC Voltage	Battery AH	Nos.	Total VAH	Make

a) The back-up time at full load shall be **120 Minutes**
b). Battery set details to be indicated by the supplier:

i). D.C. Terminal voltage
ii). No. of batteries and each battery voltage
iii). Ampere-Hour capacity of each battery
c). End cell voltage for cut off shall be considered as 1.75 / cell

27. **Testing**:

i). The supplier shall have facilities to carry out all the tests at factory center, and tests have to be satisfactorily carried out before acceptance.

ii) Tests shall be carried out and certified by the manufacturer confirming the offered specification.

(iii) If the UPS does not conform to specifications either during factory test or at site, the Bank reserves the right to reject the same. The successful tenderer shall then have to remove the same at his cost from site and supply a new piece conforming to the specifications.

iv). The Bank reserves the right to randomly decide to carry out testing of UPS systems at site after installation at the cost of UPS vendor, who will be required to arrange for all the requisite variacs, maters, loads etc. and carry out the tests through vendor's personnel in the presence of Bank's Officials.

I/We hereby declare that I/we have read and understood the above specification.

Place: Applicant's Signature

Date: Stamp: