

Technical Specifications for on-line UPS systems - 5 KVA

1.	Technology	UPS systems with pulse width modulation (PWM) technology in True On-line Configuration, with double conversion using IGBTs in the In-verter and converter having pure sine wave output with load power factor to be maintained from 0.95 to unity. The UPS must have cold start facility without break.
2.	Configuration	i) Conventional Single Module ii) PRS - The UPS systems must share the load equally and must auto-transfer the load in case of failure of any one of the system. Inter-connecting module must be inbuilt in the UPS module
3.	Inversion Technique	Adaptive pulse width modulation or sine weighted pulse width modulation with high switching frequency (> 12 KHZ for IGBTs).
4.	Input Voltage Range	(i) Single Phase - 240 Volts +15% and -30%. (ii) Three Phase of conventional - 415 Volts + 15% There should be input to output isolation through a in-built Isolation transformer. Galvanic isolation is required. MCB with alarm. UPS to be safe in case of high voltage/high current/high spike/high surges at input to UPS.
5.	Input frequency	45 Hz to 55 Hz and it should be compatible with D G Set.
6.	Output voltage	220 / 230 V.A.C. + 1% MCB with alarm. Load connected to UPS should be protected under any Circumstance.
7.	Output frequency	50 Hz +/- 4% (Synchronous to mains), 50 Hz +/- 1% (Free running)
8.	Power factor	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.
9.	Total Harmonic Distortion (o/p voltage)	<2 % for Linear load, < 4% for non-linear load
10.	Harmonic Distortion (Input current)	< 5% at 100% load.
11.	Total DC Bus Voltage	>= 120V DC
12.	Waveform (output)	Sine Wave
13.	Cold start feature	Required
14.	Overload capacity	110% for 10 minutes - During the test or in actual condition, the load should not get transferred to mains 150% for 1 minute - through static switch.
15.	Transient response and voltage recovery time for step load	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.
16.	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.
17.	Relative Humidity	Up to 95% non condensing at 35 degree Celsius.
18.	Noise level	At 1 meter from the UPS - < 50 decibels
19.	Charger	Built in IGBT based solid state float-cum-boost charger with CVCC charger with current limiting features. The charger characteristics will be such as to match the offered with each UPS. The charger should be designed for minimum 2 hours back up period.
19.	Crest factor	>3
20.	Interface facility	The UPS system should have necessary RS-232/ Port, USB

R. K. N.
P. P.
in p.

21.	Protection	<p>a). Isolation – Separate/ In-built isolation transformer shall be provided for fully isolation from mains and surge / spike suppressors to be incorporated.</p> <p>b). Current limiting protection (Fuse less Electronic). Built in overload /short circuit protection with snubber circuits for current limit.</p> <p>c). Soft start on Inverter and charger arrangement</p> <p>d). Over voltage / under voltage protection.</p> <p>e). Short circuit protection through HRC fuses</p> <p>f). Short circuit / overload protection through MCB / MCCB.</p> <p>g) All other protection systems required for safety of UPS system, such as over temperature protection etc.</p>
22.	Static Auto bye-pass switch thyristor based	Bi directional with change over time less than 10 mill seconds in free running mode and instantaneous in synchronous mode from inverter to bye-pass and vice-versa. ie without break
23.	Manual by-pass switch	Should be provided.
24.	Indications	LED/LCD display to be provided mains on, Battery on charge, Battery low, Inverter on, % load, on bye pass, over temperature etc. Mains High, Mains Low, Inverter over voltage, Inverter under voltage, Battery overcharge, Inverter overload/current etc.
25.	Alarm	<p>i). Low battery alarm to be provided (ii) % load</p> <p>iii) mains failure / load on battery alarm to be provided. Both should be audio visual. iv) Over temperature alarm in two stages. v) Overload</p>
26.	Metering	<p>Digital panel Meter or LCD display system to indicate the following</p> <p>i). A.C. voltage : Input/ output</p> <p>ii). A.C. current : Input/output or % load</p> <p>iii). D.C. battery voltage</p> <p>iv). D.C. Charging / discharging current</p> <p>v). Frequency – Input/ Output</p>
27.	Battery	<p>SMF type, Battery Backup shall not be less than 1 Hr at full load .</p> <p>The OEM must draw the inter connecting cables/wires between Battery and UPS through PVC pipes and shall not be laid haphazardly on the floor with proper clamping on to the wall.)</p>
28.	Quality standard for UPS	ISO 9001:2008
28.	Warranty on UPS	3 years on site

Technical Specifications for on-line UPS systems – 10/15 KVA

1.	Technology	UPS systems with pulse width modulation (PWM) technology in True On-line Configuration, with double conversion using IGBTs in the Inverter and converter. Built in galvanic Isolation.
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 + 15% There should be input to output Isolation through an inbuilt/ separate Isolation transformer.
4.	Input frequency	45 Hz to 55 Hz and it should be compatible with D G Set.
5.	Output voltage	220 / 230 V.A.C. + 1% single phase.
6.	Power factor	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.
7.	Total Harmonic Distortion (o/p voltage)	< 4% for non-linear load
8.	Total Harmonic Distortion (Input current)	< 10% at 50% load, < 2 % for Linear Load, < 5% at full load, Non Linear
9.	Waveform (output)	Sine Wave
10.	Cold start feature	required
11.	Overload capacity	110% for 10 minutes - During the test or in actual condition, the load should not get transferred to mains 150% for 1 minute - through static switch.
12.	Transient response and voltage recovery time for step load	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.
13.	Rated KVA	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)
14.	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.
15.	Relative Humidity	Up to 95% non condensing at 35 degree Celsius.
15.	Noise level	At 1 meter from the UPS - < 50 decibels
16.	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
17.	Battery recharge time(after complete discharge) to 100% charge	8 hrs
18.	Crest factor	> 3

		<p>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.</p> <p>Remote manageability through SNMP facility. There is a facility to monitor and broad cast to server wherever necessary condition such as :</p> <p>i) Power failure, back up time, low battery warning & auto file closure.</p> <p>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.</p>
19.	Interface facility	
20.	Protection	<p>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. Both input and output to have MCBs. Battery connection to have MCB/MCCB/Switch.</p> <p>b). Current limiting protection (Fuse less Electronic). Built in overload / short circuit protection with snubber circuits for current limit.</p> <p>c). Soft start on Inverter and charger arrangement.</p> <p>d). Over voltage / under voltage protection. MCB with Alarm. Load connected to the UPS should be protected under any circumstance.</p> <p>e). Short circuit / overload protection through MCB / MCCB.</p> <p>f). All other protection systems required for safety of UPS system, such as over temperature protection etc.</p>
21.	Manual by-pass switch	Should be provided.
22.	Indications	<p>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</p>
23.	Alarm	<p>i). Low battery alarm to be provided, (ii) % load, iii) Failure of inverter, iv) mains failure / load on battery alarm to be provided. Both should be audio visual, v) Over temperature alarm in two stages.</p>
24.	Metering	<p>Digital panel Meter or LCD display system to indicate the following :</p> <p>i). A.C. voltage : Input/ output</p> <p>ii). A.C. current : Input/output or % load</p> <p>iii). D.C. battery voltage</p> <p>iv). D.C. Charging / discharging current</p> <p>v). Frequency – Input/ Output</p>
25.	Battery	Complete with self standing cubicle or cabinet, complete with stand
	Quality standard for UPS	ISO 9001:2008
	The back-up time at full load	30 Minutes or better