

- a) 100% step load and unload (for hot standby only)
- b) 50% step load.
- c) Momentary interruption in power supply.
- d) Load transfer to bypass supply.
- e) Complete load transfer to other healthy UPS when one of the UPS develops a fault and automatic retransfer to the first UPS when it becomes healthy.

For diode rectifier type load systems, a voltage variation of up to 100% for no more than 2 cycles is acceptable at load turn on

- 5.2.20 The battery may be taken out of service for maintenance during which period it shall be possible for the UPS to continue operation by drawing power from the rectifier. Ripple content of the charger output shall not exceed 3% with battery connected.
- 5.2.21 For 3-phase UPS system, the maximum output voltage and angle variation between the phases shall not exceed 4% and 3 degrees respectively even under the condition of 100% unbalanced loading of 3-phase output.
- 5.2.22 Facility shall be provided to automatically initiate transfer of the load from inverters to the bypass supply and from bypass supply to the inverters in case of rating above 5 kVA; it shall be possible to manually initiate transfer without causing any break in the output.
- 5.2.23 All Isolator/breakers shall be adequately rated for continuous rating as well as breaking capacity as applicable. Paralleling of breaker/switch/contactors poles to achieve the required current is not acceptable. All output isolating devices shall be double pole type.
- 5.2.24 All the thyristors, diodes, IGBTs and other electronic devices of UPS shall be given adequate protection from short circuits.
- 5.2.25 All PCBs shall be provided with a transparent epoxy coating for environmental protection and tropicalisation. They shall be suitably located away from heat sources.
- 5.2.26 All electronic control and monitoring printed circuit cards shall be suitable for easy replacement. Monitoring points shall be provided with identification on each of the PCBs and the PCB shall be firmly clamped in position so that vibration or long usage does not result in loose contacts.
- 5.2.27 The fans shall be of good quality and high reliability. The failure of fan shall only cause thermal tripping at pre-set temperature without causing any damage.
- 5.2.28 Maximum noise level from UPS system measured from a distance of 1 meter from UPS in all directions under rated load shall not exceed :
- a) 55 dB for Category A
 - b) 65 dB for Category B
 - c) 75 dB for Category C

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- 5.2.29 Remote Emergency Power off (REPO) – Provision shall be available in category B & C for a wired REPO switch which shall electronically shut down the UPS by turning off the rectifier, inverter switch and battery circuit breaker.
- 5.2.30 Maintenance bypass isolator – Provision shall be available in category B & C for manually operated maintenance bypass isolator shall be incorporated into the UPS cabinet to directly connect the critical load to the input AC power source bypassing the rectifier, inverter and static transfer switch.
- 5.2.31 The UPS shall have a communication facility for connectivity with PCs.
- 5.2.32 UPS shall be provided with capability to support SNMP(Smart Network Management Protocol) communication port with hardware and software for remote monitoring. This will be an optional feature and is not to be provided, unless specifically called for in the indent / tender.
- 5.2.33 The UPS shall have a data logging facility, with USB download capability. This will be an optional feature and is not to be provided, unless specifically called for in the indent / tender. The data logged shall be:
- 80 faults in a FIFO with date and time stamp (faults to be recorded include, but are not limited to, those listed in section 5.4.4 (B),)
 - The LCD display shall enable interrogation of the fault data log by the operator
- 5.2.34 **Functionality of UPS**
- Load shall be transferred between UPS 1 and UPS 2 with periodical intervals of one month.
 - Load shall be transferred to the other UPS after a month's time even if the UPS supplying the load is healthy.
 - In case of failure of UPS, the other healthy UPS automatically takes over the load without any break.
 - In case both UPSs fail, then only load shall be transferred to appropriate bypass.
- 5.2.35 A visual indication and audio alarm shall be provided for load on bypass mode or if any one of the UPS is defective. The visual indication and audio alarm are to be provided at the place where the operators of the system are available so as to alert them about the abnormality in the system. This will be an optional feature and is not to be provided, unless specifically called for in the indent / tender.

5.3 Construction

- 5.3.1 Rectifier/charger, inverter and static switch sections shall be suitably housed in sheet steel panels complete with all interconnections. The panels shall be fabricated with min. 1.2 for Cat A and 1.6 for Cat B & C-mm thick cold rolled sheet steel and structural steel.

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