

NetApp Energy Star For Storage Draft 4 Specification Response:

Lines 174-176 and 183-185

- Could the wording be clarified as follows: “For purposes of this specification, the total rated output power from all additional PSU outputs that are not primary (i.e. standby or standbys) shall be less than or equal to 20W \pm 10%.”

Lines 262-283

- Clarification required with math examples – Energy Star to provide by 4/26/2013.

Lines 649-660

- In the spirit of not constraining or favoring one implementation over another, can the Spec be worded to accommodate either a PSU based implementation that reports Input Power on a per PSU/Plug basis (or a per chassis basis) and an iPDU based implementation that reports Input Power on a Per iPDU feed basis?
- Can the granularity of reporting allow these levels of flexibility?
 - Power per plug?
 - Total power per chassis?
 - Total power per system
 - If we use iPDU, can it be per iPDU?

Lines 675-679

- Input power: Input power measurements must be sampled internally to the storage product. The input power should be sampled at least once in a 10 second interval. The samples must be contiguous (unless the optional time stamping is utilized). A rolling average may be used (optional) to filter spikes and noise. If implemented, the averaging period must be no longer than (\leq)30 seconds and contain at least 3 contiguous samples.

Line 705

- What does “Be made available for sale and delivery” mean?
 - Do we have to sell it or offer it as an option?
 - What if the customer already has a data reporting PDU in his facility?
 - What if he is purchasing multiple systems that can share a single PDU?
 - Can we refer the customer to a third party to purchase an approved iPDU?

NetApp Draft 2 Test Method Questions:

Table 1 & 2

- 3 Phase Voltages – Need to add 400 V ac for EU

Table 3

- 3 Phase Frequency – Need to change to “50 HZ or 60 Hz” for EU

Regarding the Voltage Tolerance in the test tables:

- +/- 1.0% voltage sources cost in the neighborhood of \$5,000 per 1000W. Storage systems in taxonomy 4 can use several thousand watts. A 400 drive mid-range system can exceed 10,000 watts.
- In the US, many data centers run on 208 Volt power, not 230 Volt.
- NetApp took data on PSU efficiency as a function of input voltage (Table 1 below).
- The difference in efficiency between 207 Volts and 230 Volts is less than 0.2% at all load levels.
- Testing at 208 Volts would result in a loss of performance of less than 0.2%.
- NetApp is willing to accept a loss of 0.2% in the performance metric to allow testing at the available line voltage in the lab/test house to avoid the large capital expense of multiple voltage sources.,

TABLE 1: PSU Efficiency as a Function of Input Voltage

PSU Model _ sl. No.	Vin	Iin	PF	Pin	12V	I_12V	5V	I_5V	5Vsb	I_5Vsb	Pout	Efficiency	Load	
TDPS-50CB A _ 003 (Gold PSU)	230.0	0.620	0.921	131.335	12.010	6.510	5.011	7.173	5.142	0.333	115.841	88.20	20%	
	207.0	0.673	0.941	131.092	12.010	6.510	5.011	7.173	5.142	0.333	115.841	88.37		
	253.0	0.588	0.890	132.400	12.010	6.510	5.011	7.173	5.142	0.333	115.841	87.49		
	230.0	1.389	0.983	314.039	12.010	16.278	5.007	17.981	5.102	0.858	289.907	92.32	50%	
	207.0	1.538	0.988	314.546	12.010	16.278	5.007	17.981	5.102	0.858	289.907	92.17		
	253.0	1.273	0.979	315.306	12.010	16.278	5.007	17.981	5.102	0.858	289.907	91.94		
	230.0	2.816	0.985	637.965	12.030	32.557	5.002	36.003	5.076	1.732	580.539	91.00	100%	
	207.0	3.133	0.986	639.452	12.030	32.557	5.002	36.003	5.076	1.732	580.539	90.79		
	253.1	2.547	0.987	636.265	12.030	32.557	5.002	36.003	5.076	1.732	580.539	91.24		