

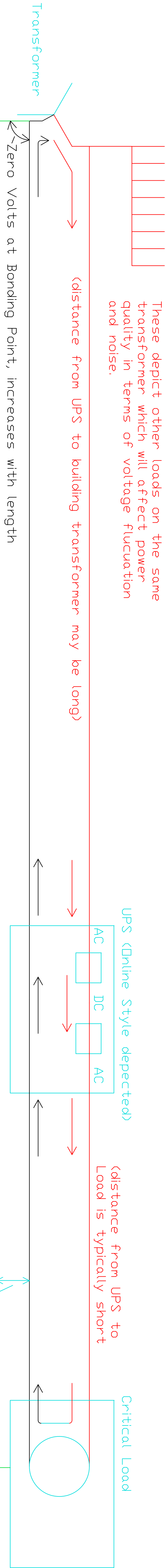
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Understanding the Differences Between Isolated and Non-isolated UPS Systems

The top schematic shows the electrical current path to the load for a non isolated UPS. The red line is the phase voltage and current path from source to the load. The black line is the neutral return current path. The voltage and current originate at the building transformer and may be modified in the UPS. With an online UPS as depicted, the voltage is altered from AC to DC and back to AC, correcting voltage and frequency concerns. If this was a SmartUPS style UPS the AC DC AC conversion would not be included and in that case the only components normally working inside the UPS would be a MOV type surge suppressor, similar to a power strip surge suppressor. Problems may arise in these configurations due to 1) the typically long distance from the building transformer to the UPS and 2) due to that transformer feeding other building loads such as electronics, air conditioning motors, office equipment, lighting, etc. Some of these loads would be electrically noisy. The long length also produces voltage drop. The online UPS will correct that. The 'SmartUPS' type UPS will correct that only when voltage has fluctuated significantly. The greater concern is the other loads and large distance allows for a greater neutral to ground voltage and noise. This may cause load operation upset and is known as common and normal mode noise. For computing devices differentiating between 0 and 3 volts on a fast time basis, noise can cause data errors and upset, lockup or errant electronic decisions.

These depict other loads on the same transformer which will affect power quality in terms of voltage fluctuation and noise.

(distance from UPS to building transformer may be long)

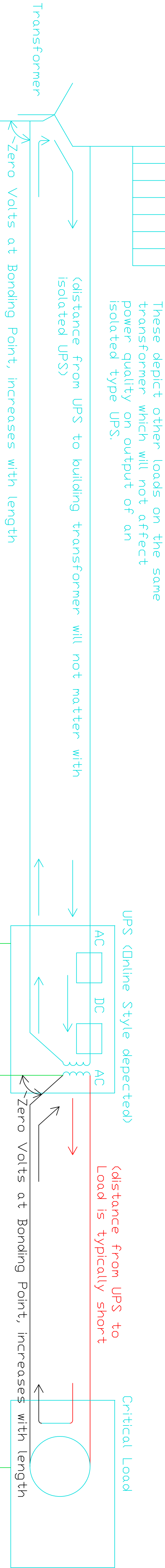


By Code, Neutral is bonded to Ground and tied to building steel at transformer. This results in zero volts N-G at transformer. As we move away from transformer we lose the zero volts condition for both voltage and noise.

The bottom schematic shows the electrical current path to the load for an isolated UPS. Again, the red line is the phase voltage and current path from source to the load. The black line is the neutral return current path. The voltage and current at the building transformer will still be modified in the UPS. With an online UPS as depicted, the voltage is altered from AC to DC and back to AC, again correcting voltage and frequency concerns. However now the load source is actual derived within the UPS and is close to the critical load. Noise and voltage drop issues are greatly reduced, to near zero in most applications. This configuration will protect the load from, all relevant power concerns, including noise and voltage drop. An ideal electrical environment is provided to the critical load.

These depict other loads on the same transformer which will not affect power quality on output of an isolated type UPS.

(distance from UPS to building transformer will not matter with isolated UPS)



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Isolated and Non-isolated UPS System Differences		SIZE	PROJECT NO.
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		SCALE	-
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