

United Engineering Company, Inc.

6095 Lake Forrest Drive, Suite 170, Atlanta, GA. 30328

PH (404) 256-4871 Fax (404) 256-0671

Why Install and Use a Piller Rotary UPS vs. a Static UPS?

1. Principle Difference

A rotary UPS generates a natural sine wave from a generator (alternator) just like the main utility power on the national grid. A static UPS produces an approximated sine wave by chopping DC (direct current). This means that the quality of the sine wave is superior in a rotary system.

2. Reliability - Complex Design

The natural generation in a rotary UPS means that relatively few components are required. Complex switching and control circuitry is required with static UPS; the more complex the system, the less reliable the solution.

3. Reliability - Input Current Distortion

The rectifier at the input to a static UPS converts AC to DC and creates harmonic distortion that is reflected back to the grid supply. Additional expense is required to filter out these harmonics. This requires the insertion of harmonic filters which further reduces reliability. This does not exist with a rotary UPS.

4. Reliability - Power Capacitors

Power capacitors are one of the most unreliable components in electrical design. A static UPS requires capacitors for power factor correction, input harmonic distortion and output harmonic distortion suppression. These capacitors are prone to fail which significantly reduces the reliability of a static UPS system. Good rotary UPS systems have no power capacitors.

5. Inherent Fault Clearing

All static UPS have a major drawback in that they are unable to clear faults inherently. That is to say that their ability to deliver fault currents is severely limited (typically less than three times nominal current). In clearing a fault, they transfer to utility using their bypass. This is tolerable except for battery operation where the load is lost. A rotary UPS can clear the fault in all modes of operation. This is fundamentally significant. To increase overload handling capabilities of static UPS, it is not unusual to employ oversized modules. This has a cost and space penalty.

6. Distorted Loads

In circumstances where loads are highly distorted (e.g.: computer data centers) the static UPS is limited in the peak current it is able to support (typically less than three times). If the static UPS is unable to deliver the necessary current, then the voltage is clipped. This clipping of the voltage can disrupt the operation of the load. Rotary UPS's do not suffer from this characteristic.

7. Reliability - Conclusion

With the points mentioned above, it is quite possible to have a rotary UPS with reliability ten times greater than that of its static counterpart.

Advantages of Piller UNIBLOCK-R vs. Static UPS (Comparison of 750 kVA size modules)

1. Employs a dual input / power path design vs. single input / power path design for static UPS
2. Exhibits the lowest output voltage distortion of 1.5% vs. 3 to 4 % for static UPS
3. Provides the best overload capability at 150% for 120 seconds vs. 30 to 60 seconds for static UPS
4. Provides highest short circuit current capability of 12 times rated current vs. 3 or less times rated current in static UPS
5. Contains no power capacitors for high reliability vs. all static UPS contain power capacitors
6. Operates at efficiency of 94.5% vs. 93 to 93.5% for static UPS
7. 30 sq. ft. footprint vs. 33 sq. ft. and greater for static UPS
8. Calculated MTBF of 630,000 hrs. vs. less than 300,000 hrs. for static UPS