

# The Philtek HPRi Inverters vs. Commercial UPS Systems in Telecom Applications

The Philtek HPRi Inverters redefines inverter performance and flexibility in the delivery of AC power to telecom equipment. This break through in technology allows the inverters to supply the level of large output capacities (up to 180 KVA), previously unheard of in the industry, from a 48 VDC source. It provides not only a viable alternative to the UPS; it offers many additional benefits as well.

The following is a comparison between the HPRi Inverters and commercial UPS's in telecom applications:

## (1) Battery: 48 V or 400 V

The 48 V Battery is perhaps the most important component in the telecom power system. It requires regular inspection and maintenance. At most sites, *premium* grade 20 years battery are used. Multiple strings are connected in parallel to increase the battery capacity or to provide redundancy. Because of the relatively low potential of 48 V, maintenance work is relatively simple and often performed live.

### Philtek 48 VDC HPRi Inverter

- Utilize the existing 48 VDC power plant, much safer and easier to maintain.
- Multiple strings of 24 x 2-Volt cells connected in parallel to form a telecom battery. Redundancy is built into the system.
- Premium grade batteries are always used as the backbone of the system.

### Commercial UPS Systems

- A *separate* high voltage battery typically 400 to 500 VDC is required. Hazardous and difficult to maintain.
- Hundreds of 2-Volt cells connected in series to form a single string of battery, should any one single cell become defective the whole system would fail.
- Unless premium grade battery is specified, many UPS vendors will quote commercial grade 3 to 5 years battery with the UPS for competitive pricing.

## (2) Output Capacity Expansion:

With the competitive nature of the telecom business, the capital cost of equipment and installation is a major concern to many corporations. The exact power requirement of a site is difficult to predict. Any power system capable of incremental expansion without incurring any additional installation cost will offer tremendous financial benefits.

### Philtek 48 VDC HPRi Inverter

- Purchase and install a HPRi AC Power Plant, available capacity from 15 KVA to 60 KVA single phase, 15 KVA to 180 KVA three phase, at a minimal cost. Install sufficient Inverter module(s) for the present need.
- For capacity expansion, simply add “hot-pluggable” Inverter module(s) on the fly. There is no AC power interruption in the process. All installed Inverters will load share equally.

### Commercial UPS Systems

- Either to purchase the Largest UPS for all your future power requirement (very costly), or a UPS sufficient for the present need, which will have to be replaced and disposed of, if the power requirement grows.
- UPSs’ in general, are *not* modular, parallelable or “hot pluggable”. To upgrade you will have to replace the existing UPS with a larger one, or add another UPS for the additional loads. The installation cost, and the power disruption during switch over, are the main issues that need to be addressed.

## (3) Reliability:

In Telecom DC power systems, redundancy in design is the key to reliability. Multiple rectifier/chargers and batteries, with excess capacity, are connected in parallel, equally sharing the total load. A single component failure will result in the load being shifted to the remaining good ones. Hence the DC power is never disrupted. A parallel inverter system with N+1 redundancy works on the same principle. When connected the Telecom DC, it will provide the same degree of AC Output reliability as the DC. In many sites the AC power is just as crucial as the DC power!

### Philtek 48 VDC HPRi Inverter

- Parallel connected inverter N+1 modules provide AC power output with reliability equal to the Telecom DC power.
- A 60 KVA output redundant Inverter system requires 7 inverter modules at 10 KVA each. A total capacity of 70 KVA is required while operating at 60 KVA as a redundant system.

### Commercial UPS Systems

- A typical UPS consisting of a single rectifier, battery and inverter, is prone to a single point failure that will bring down the entire system.
- Parallel redundant UPSs’ are few and available only in very large capacity. A 60 KVA UPS parallel redundant system requires two 60 KVA UPSs’. A total capacity of 120 KVA is required while operating at 60 KVA.

#### **(4) Service Cost and Down Time:**

Maintenance and service cost of a power system will affect the bottom line. Down time will cause service disruption to valuable customers.

##### Philtek 48 VDC HPRi Inverter

- Just like the Modular Switch-mode rectifiers, the “Plug and Play,” Modular Inverter and Static Switch design allows on-site technician to replace any faulty module without special training. Service contract is *not* necessary.
- No down time with N+1 configuration, any faulty inverter module can be replaced with no power disruption
- Obtain exchange units from stocking locations and return the faulty unit to the factory.

##### Commercial UPS Systems

- Almost impossible, probably not recommended, for on-site technician to service. Costly annual maintenance contact with a service organization is a necessity.
- A power disruption is possible during a failure condition with a single UPS configuration.
- A service technician has to be dispatched from the nearest service center. Their response time will contribute to your total down time and the MTR. Some services may require shutting down the complete system.