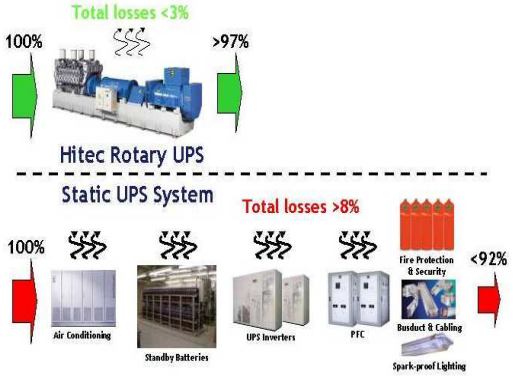
Environmental benefits Hitec DRUPS systems

The Hitec Diesel Rotary UPS (DRUPS) module is designed to provide conditioned and secure UPS power to a facility's critical loads and standby power to a facility's less critical essential Loads. In so doing it replaces the battery backed static UPS equipment required to support the essential loads and the standby diesel generating equipment required to support the essential loads. By combining these two functions within a single piece of equipment the Hitec DRUPS module provides tangible and measurable environmental benefits over alternative UPS equipment.

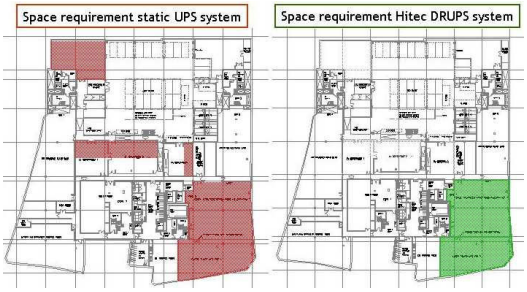


Best operating efficiency

Energy efficiency is a hot issue on a global level, for example in the data centre industry. Initiatives like the Green Grid and the Code of Conduct for Data Centres, indicate that cutting down on the energy use will become compulsory in (near) future. Hitec DRUPS systems need fewer active components than static UPS systems and the design does not require power conversion. Both have great impact of the operating efficiency of an UPS system. DRUPS modules can achieve efficiency levels greater than 97%, whereas the efficiency level of the best static UPS equipment will be around 92%.
Static UPS suppliers will tell you differently, but do they take energy use for all needed components into account, like the cooling needed for the battery room? Next to the environmental benefits of using the most energy efficient system, it of course directly has a positive effect on the operating costs. 5% gains in energy efficiency using a Hitec DRUPS system in a middle-sized data centre, with a load of say 10 MVA, can easily save you over 300.000 Euro per year.

Battery free system

Unlike static UPS systems the Hitec DRUPS module uses stored mechanical energy to secure the critical load, not batteries. The batteries used in static UPS systems are normally of the Lead Acid or Nickel Cadmium type, both considered to be environmentally damaging. They contain harmful, hazardous and carcinogenic materials such as Lead Compounds, Cadmium, Mercury and Sulphuric Acid. The number of batteries used in the design of a static UPS system is dependent on the size of the load to be supported and the amount of time that the batteries are required to support it, the so called standby time. With large loads and standby times the required number of batteries can amount to several thousands. Batteries have an expected life span of 5 to 8 years, leading to even more chemical waste. This fact has not gone unnoticed by authorities worldwide. Both Lead Acid and Nickel Cadmium batteries are classified as hazardous waste and for example the European Union is working on a new 'Battery Directive' to ensure the safe and proper disposal of such batteries. Hitec DRUPS module do not use environmentally damaging and hazardous materials, therefore its environmental impact is considerably less than static UPS systems cause.

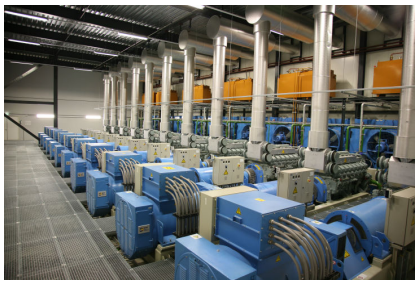


Low use of space

Hitec DRUPS modules require approximately 40% to 60% less space than an equivalently sized static UPS system plus standby diesel generator. A DRUPS system does not need batteries and related air condition equipment, power factor correction panels, generator paralleling/synchronising panels and an overall simplification of the distribution switchgear. All is already standard included in the Hitec DRUPS design.

Scalable modules

Hitec DRUPS modules can easily put in parallel, so you can configure the output according to the required power need in time. Why install the full load from start if you have planned a staged approach in capacity? That is a waste of energy and money. Other advantage of the Hitec DRUPS design is that migration of loads from critical to essential and visa versa can be accommodated without the need to procure additional standby generating capacity and/or static UPS modules. Providing that the total load being drawn does not exceed the UPS rating of the DRUPS module the ratio between critical and essential loads can be reconfigured.



Optimal use of available diesel engine technology

Hitec Power Protection selects its diesel engines based upon a number of key criteria. In terms of their load handling performance the diesel engines must have a high reliability, the necessary total power output and the required speed of starting. However, to address the environmental impact of the diesel engine we can also select diesel units that have a high fuel economy, lowest emission level and the ability to run on zero sulphur diesel fuels. To minimise the number of diesel engines starts when incoming mains supply is out of specification, we offer 'Diesel Start Reduction' as an option. Diesel Start Reduction maintains the DRUPS module output voltage within tolerance while allowing the input mains voltage to fluctuate within prescribed limits. The fluctuation of the input voltage is allowed to occur for a given period of time before it becomes necessary to start the diesel engine. This option will considerably reduce the yearly number of diesel starts.

Integrated power conditioning

Combined use of a synchronous alternator and matched UPS choke within the Hitec DRUPS module ensures that all load-generated harmonics are prevented from reaching the incoming supply. This combination of components also ensures that all mains born harmonics are prevented from reaching the load. As such a Hitec DRUPS module is fully compliant with the requirements of EA Recommendation G/54 (Guidance on the generation and imposition of harmonics on the Public Utility Network) without the need to employ additional, inefficient and expensive harmonic filtration equipment.

Power Factor Compensation

The combination of the synchronous alternator and the matched UPS Choke enables to provide all of the reactive power demanded by the load. This means that the incoming utility supply is presented with a near unity power factor under all load conditions. Therefore there is no need to provide additional power factor correction equipment.

Hitec Power Protection DRUPS feature	Environmental benefit
- Best operating efficiency	- Lowest energy consumption
- No batteries	- No chemical waste
- Low use of space, no battery room	- No dedicated cooling battery room
- Scalable modules	- Only energy use when needed
- Optimal use of diesel engine technology	- Low emission levels
- Integrated power conditioning	- No additional harmonic filter required
- Integrated power factor compensation	- No additional power factor correction required

Our organization

We continually assess the environmental impact of our products and how the efficiency, reliability, power and performance of the Hitec DRUPS module can be improved. Constant research and development efforts support Hitec Power Protection's commitment to offer the most environmentally sustainable UPS solution on the market. Examples are active investigations into the use of Bio-diesel and alternative energy sources like fuel cells. All these initiatives are embedded into our Environmental Policy Statement, but most importantly it motivates and is in the minds of our people.

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