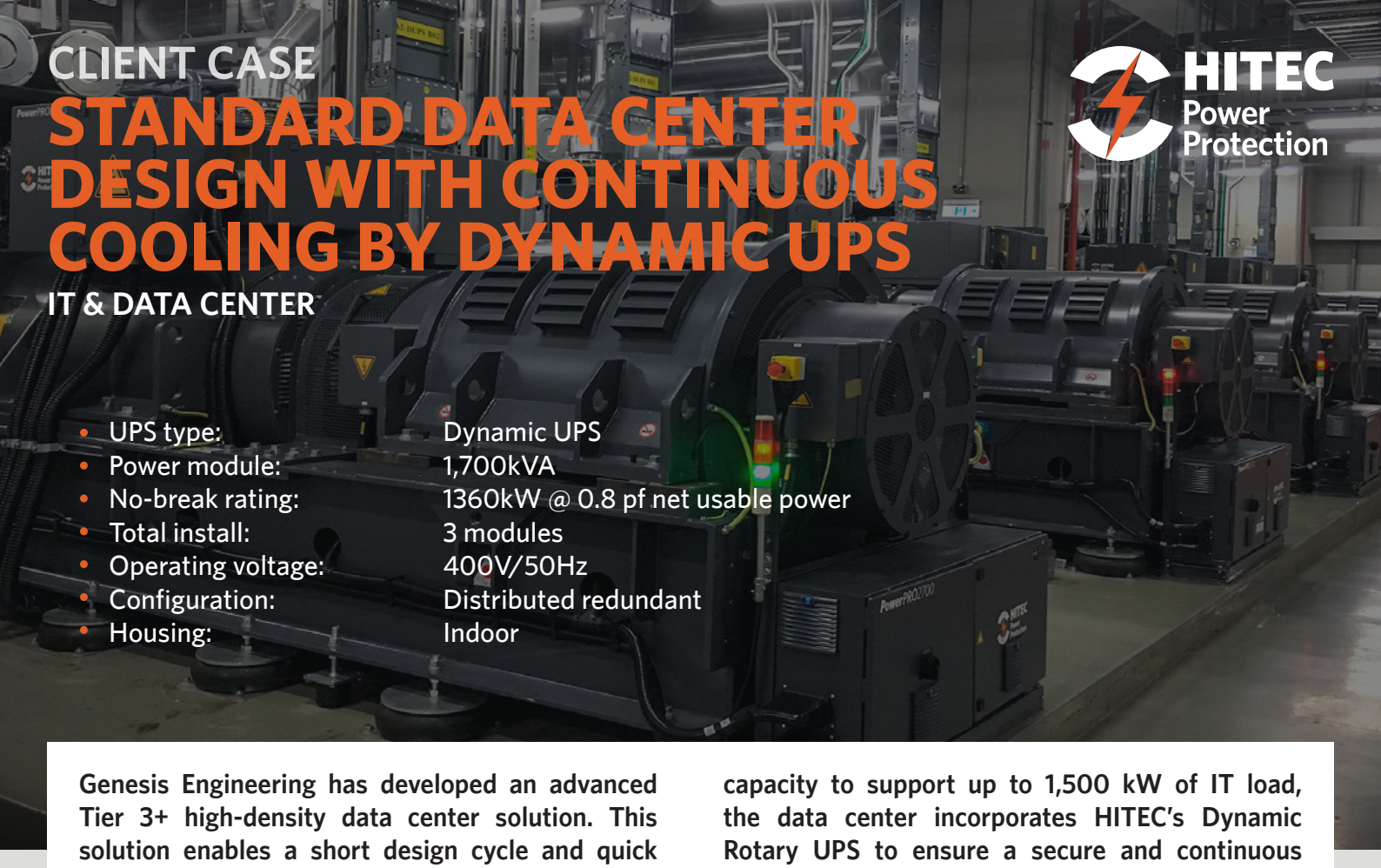
CLIENT CASE

STANDARD DATA CENTER DESIGN WITH CONTINUOUS COOLING BY DYNAMIC UPS

IT & DATA CENTER



- UPS type: Dynamic UPS
- Power module: 1,700kVA
- No-break rating: 1360kW @ 0.8 pf net usable power
- Total install: 3 modules
- Operating voltage: 400V/50Hz
- Configuration: Distributed redundant
- Housing: Indoor

Genesis Engineering has developed an advanced Tier 3+ high-density data center solution. This solution enables a short design cycle and quick construction, while optimizing reliability, saving space, and reducing ownership costs. With the capacity to support up to 1,500 kW of IT load, the data center incorporates HITEC's Dynamic Rotary UPS to ensure a secure and continuous power supply for critical systems, including cooling.

Project Solution

Genesis Engineering has extensive experience designing and building data centers, particularly those where the cooling system is supported without interruption by a HITEC Dynamic Rotary UPS system. Providing uninterruptable power to a data center cooling system eliminates the need for additional cooling equipment and control measures and simplifies the overall mechanical design. The result is a highly reliable and stable infrastructure in which no loads are lost nor reinstated after a power failure, and in which sufficient cooling is continuously delivered to the IT servers.

The facility designed by Genesis accommodates 168 server racks split across three IT rooms. Each IT room is deigned to handle a maximum IT load of 500kW and up to 20kW per rack.

To minimize access and human error, the IT rooms are isolated from their supporting engineering systems, such as air handling and switchgear.

The cooling system uses a liquid-based ethylene glycol solution to prevent freezing during cold weather. There are 6 chillers and Computer Room Air Conditioners (CRAC's) installed per IT room, with an N+2 redundancy level for high fault tolerance and concurrent maintainability.

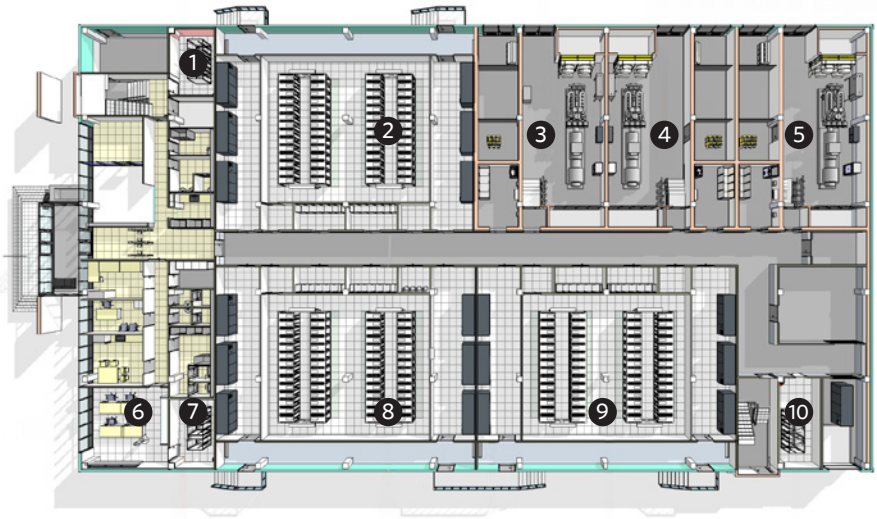
The cooling system is designed for simplicity, with each chiller directly connected to a CRAC unit thereby avoiding complex ring topologies. This design minimizes the risk of leakages and common mode failures and simplifies operation and maintenance.

The system operates at a coolant temperature of 12-23°C, which prevents air conditioner condensing, extends free cooling periods, and enhances overall efficiency.

The HITEC Dynamic UPS system comprises three PowerPRO2700 units with a total UPS capacity of 2720 kW. The units are configured in a 2 from 3 Distributed Redundant arrangement that ensures fault-tolerant operation, optimizes power system reliability and enables concurrent maintainability.

Floorplan of data center

1 Third party operator room 1
2 IT room 1
3 HITEC PowerPRO2700 unit A
4 HITEC PowerPRO2700 unit B
5 HITEC PowerPRO2700 unit C
6 Monitoring room
7 Server room
8 IT room 2
9 IT room 3
10 Third party operator room 3



Key Advantages

1. Pre-designed solution: The pre-designed data center package offers a streamlined approach. It minimizes the time for the design stage allowing the construction to begin immediately after the decision is taken to build a new data center. It also ensures performance and investment costs are predictable from the start.

2. Cost optimization: The use of optimally rated key components and the integration of fault-tolerant features into a Tier 3 design keeps costs lower than a Tier 4 solution while maintaining best-in-class operability.

3. High reliability: The use of Dynamic UPS simplifies the overall power and cooling infrastructure when compared to traditional designs with Static UPS, batteries, and diesel generators. Less connections, reduced components, and fewer control interfaces result in operational simplicity and increased reliability.

4. Optimized Tier 3+ design: This design offers not only redundant components and multiple independent distribution paths, but also concurrent maintainability thereby eliminating single points of failure within the power and cooling systems.

5. Battery-free and environmentally friendly design: HITEC's Dynamic Rotary UPS combines supply conditioning/filtration, UPS, and long-term energy generation within a single system. The integration of stored kinetic energy to provide power continuity when the utility fails removes the need for batteries and extends the system's operational lifespan to over 25 years.

With the HITEC Dynamic UPS providing continual power support to the cooling system, thermal buffers and cold-water storage can be completely removed from the design, which saves around 160 m2 of space. Using a HITEC Dynamic UPS reduces the power infrastructure space by 40%, and the removal of Static UPS and batteries reduces the CO2 footprint by 70%. Moreover, the design utilises fully recyclable, non-hazardous materials, avoiding the environmental impact of battery production and disposal.

Customer Experience

By selecting the predesigned data center, the client can rely on proven investment information and on the most reliable power protection solution for their data center. It enables a short design cycle and to start construction quickly. Combine that with the most effective solution for increasing criticality of data center cooling and the use of a Dynamic UPS system which simplifies and consequently increases the reliability of the electrical infrastructure.

Additionally, the data center cooling system has increased reliability and simplicity by putting the cooling system on a no break supply eliminating additional Continuous Cooling measures. The Uptime Institute recommends that continuous cooling is provided for server densities beyond 4kW per rack regardless of Tier level. For that purpose, the Dynamic UPS systems deployment in this standard data center is an ideal and proven solution.

HITEC Power Protection

CONTINUOUS POWER
IN YOUR CONTROL

HITEC Power Protection BV
P.O. Box 65
7600 AB Almelo
The Netherlands

Tel: +31 546 589 589
Web: hitec-ups.com
E-mail: info@hitec-ups.com