Overview

CASE STUDY:
Baudouin | Margen Spa | ENI Data Centre | Italy

PRODUCT:
5 x Baudouin 20M33G2500/5 PowerKit Engine

DISPLACEMENT:
20M33 = 65.4 litres 20-cylinder diesel

TOTAL POWER OUTPUT:
5 x 2 700 kVA = 13 500 kVA

DUTY:
DCP Data Centre Critical Backup Power

APPLICATION:
High-Performance Computing (HPC) Data Centre

PARTNERS:
OEM: Margen S.p.A.
INSTALLATION: ENI S.p.a. Data Centre "Zephyr"

ZEPHYR: ENI Green Data Centre in Northern Italy Rafinery

In 2024, ENI, a global energy leader, expanded its Green Data Centre in Northern Italy to host a new high-performance supercomputing system based on innovative concepts that make it one of the most energy-efficient DC in the World, with a certified PUE< 1,2. To safeguard this critical HPC facility from any mains power outages, OEM partner MARGEN S.p.A. designed and delivered a robust emergency power system with Baudouin as the engine supplier. The installation consists of five containerized, soundproof diesel generator units, each equipped with a Baudouin 20M33 PowerKit engine. Together these five units provide 13.5 MVA of standby power capacity, enough to support the data centre's entire electrical load with full N+1 redundancy. (The HPC6 supercomputer alone can draw over 10 MVA at peak, so the backup system was sized to comfortably handle the demand with one genset as a spare.) The result is a highly reliable power infrastructure that ensures uninterrupted operation of Eni's mission-critical data centre even in emergency scenarios.

Each of the five generator sets is powered by a Baudouin 20M33G2500/5 PowerKit engine – a 20-cylinder, 65.4 L V-type turbocharged diesel with high-pressure common-rail fuel injection. This engine is rated for up to 2,750 kVA of standby electrical output. In the Eni data centre project, the engines are integrated into fully self-contained power modules. MARGEN engineered these modules with on-board step-up transformers (installed inside each container) to deliver 20 kV medium-voltage output directly to the facility's electrical distribution. This design allows the gensets to feed the data centre's power system without external transformer yards, minimizing footprint and installation complexity. The generator units are housed in specialized sound-attenuated enclosures to meet strict noise level requirements, given the proximity to operational areas. The system is configured for automatic start and fast load acceptance – if a grid outage occurs, the gensets can ramp up and synchronize quickly, supplying stable power to the HPC servers and cooling systems within seconds. The overall power architecture, with five identical genset units, provides both the capacity and the redundancy (N+1) required for 24/7 uptime of Eni's HPC data centre.

The success of this project highlights several key advantages of Baudouin's PowerKit engine solutions. The 20M33 engines deliver a very high-power density, which allowed MARGEN to package five 2.7 MVA generators into containerized units with relative ease. This compact, modular design simplified transportation, on-site installation, and future scalability of the backup system.
Baudouin's PowerKit DCP (Data Centre Power) engines are specifically engineered to meet the stringent demands of modern data centres. Key features include a comprehensive product range from 590 to 3300 kVA, catering to various data centre requirements; a robust and reliable design for secure power provision; dual starter options providing increased redundancy; high transient and block load capabilities ensuring dependable load step and load following capability; and a market-leading warranty offering 2 years of coverage with unlimited working hours, underscoring Baudouin's commitment to quality and reliability. These features make Baudouin's PowerKit DCP engines the ideal choice for data-critical backup power, ensuring that facilities like Eni's Green Data Centre maintain uninterrupted operations.