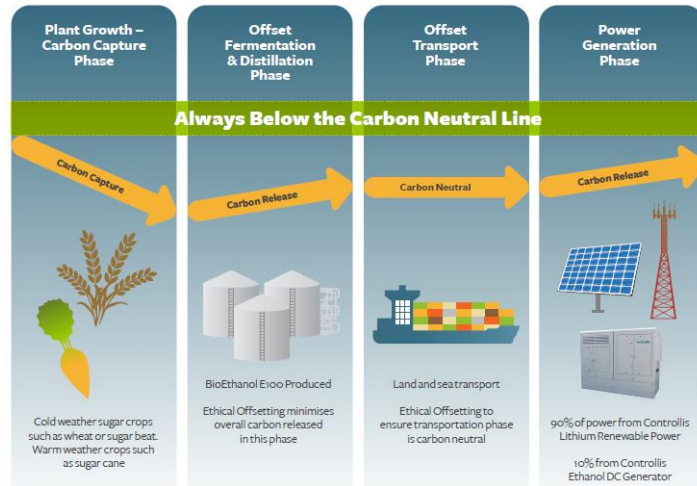




Controllis Zero

Carbon neutral hybrid renewable power system



Controllis Zero is a hybrid renewable DC power solution for off-grid and poor grid telecoms sites. Controllis Zero provides cost effective, highly reliable and flexible site power provision with net zero carbon emissions.

Controllis Zero is an addition to the Controllis Modular48 product family. As part of our Hybrid Renewable platform we predominantly use solar arrays and our IonLiFe[®] lithium ion batteries to provide site power. As required, the system utilises an E100 bioethanol engine to power our 48VDC generator which recharges the battery bank. The site is powered by solar and batteries for up to 90% of the time, with the remaining power provided by renewable bioethanol instead of diesel. The Controllis solution is highly efficient and totally carbon neutral.

Controllis Zero advantages

Controllis Zero eliminates the dependency on fossil fuels, instead providing clean and reliable site power from renewable sources. The system is smart and automated, prioritising renewable energy over conventional fuel use. Key benefits of deploying Controllis Zero include. -

- Zero net carbon produced
- Lowest operating cost for site power and lowest cost to the environment
- Bioethanol fuel can be locally produced and easily transported
- Aligns with global ethical and environmental objectives
- Data analytics provide comprehensive insight into energy generation & utilisation

Renewable energy integration, operation and insight

The performance of all components of Controllis Zero (renewable energy, battery, generator, engine, enclosure and fuel tank) are seamlessly integrated with the Controllis Remote Management Server. This provides comprehensive remote monitoring, control and configuration of the entire hybrid system performance, minimising operational costs.

Controllis data analytics suite provides detailed, real time & exportable analysis of component and system performance. This enables operators to evaluate how a site is performing, understand why a site is operating in a specific way (for example how much is solar contributing to energy creation compared to bioethanol) and optimise site and network performance. Controllis analytics can help create detailed energy use dashboards and reports which in turn help operators communicate their carbon reduction achievements.



Renewable Energy Integration

All Controllis DC generators integrate easily with renewable energy solutions. The Modular48 can be supplied with optional 48V solar PV charging controllers for up to 15 kW of solar capacity. The solar controllers are integrated with the Controllis SC-HMU via MODBUS to provide full remote visibility of the entire system including solar output and battery status. For certain panel types the Modular48 can individually monitor their performance and report the results to the RMS. This enables easy identification of damaged or shaded panels. When power demand is not met by the solar output or the energy stored in the battery bank, the Modular48 generator automatically activates and takes over the battery charging and site load role until the renewable source can again provide sufficient energy to meet site needs. The Modular48 generators can also be integrated with other renewable energy sources.

Highly scalable and protected battery

The Modular48 has an internal, scalable lithium ion battery capacity of up to 100 kWh. As the system is monitoring the battery charge, discharge and temperature parameters Controllis are able to offer industry leading warranties for our battery systems. The battery enclosure can be cooled (as required) by either single or dual 500W or 1000WDC air conditioners which are remotely monitored.

All Controllis DC generators have been specifically developed to provide a safe and controlled solution for charging DC battery banks. The system monitors battery voltage, battery temperature and load current, and uses internal battery charging algorithms to provide the correct amount of voltage and current into the battery bank for the given conditions. Controllis developed algorithms control the engine speed 50 times per second to vary the voltage to the appropriate level. In addition to the software control there are built-in hardware protection circuits that ensure the battery bank is never overcharged.

Ultra-Efficient DC generator

Controllis DC Generators have been designed to drastically reduce fuel consumption in site operation. These savings are accomplished by

- The very high efficiency Controllis DCPrimePower® permanent magnet generator (PMG)
- Varying the engine speed according to site loads, therefore lowering fuel consumption by producing only the precise amount of power demanded
- Mounting the DCPrimePower® PMG directly on the engine fly wheel, negating the need for couplings or bearings.

The fuel savings for a typical site load compared to a modern correctly sized AC Generator and rectifier are usually between 20% and 25%. For smaller site loads hybrid operation using a battery bank can reduce fuel usage by up to 70% compared to a traditional AC installation. On sites suitable for solar and/or wind renewables a Controllis hybrid solution can reduce annual fuel usage by up to 90%

Flexible Deployment platform

The modular48 is highly scalable and configurable with a wide range of deployment options. The system can be deployed in standalone, dual or hybrid mode. The system can also house and power third party telecoms equipment

Durable cost effective construction

The Modular48 enclosure is constructed using durable powder coated zinc plated steel and can be deployed in diverse environments.

Warranty, Support and Finance

All Controllis DC generator systems are sold with a comprehensive multi-year warranty on parts and labour. Controllis provide comprehensive support and training during the installation and commissioning phase of new deployments. After installation we provide 3rd tier support to your system managers on an as required basis.

For larger deployments we can provide different financing options to qualifying companies.



Power Output 7kW to 24kW DC 48-57V

Voltage Ripple <10 millivolts RMS

Engine 3 cylinder E100 bioethanol engine

Fuel E100 bioethanol

Built in Hybrid Remote Power Controller

- Auto Engine Start
- Electronic Throttle Control
- 48V Intelligent Charging System
- 12V Intelligent Charging System
- Battery Temperature Monitoring
- Fuel Level Monitoring and Reporting
- Oil Level Monitoring and Reporting
- Optional Oil, Fuel and Air Filter Condition
- Pressure Drops
- Coolant Temperature
- Oil Temperature
- Environmental Temperature
- Exhaust Temperature

Communications Ethernet & RS485, built in LTE / UMTS / GSM

Internal Battery Up to 100 kWh, Lithium-ion

Optional Internal Fuel Tank 1,100 litres

Corrosion Protection All external components are powder coated aluminium or zinc plated steel

Paint Oven Baked Polyester Powder Coated

Colour Standard RAL7035 (Other colours optional)

Noise Level Less than 55dBA at 7m standard enclosure

Environmental Operating Temperature

-40C to +55C

Internal Insulation Class O fireproof acoustic foam

Enclosure Outdoor Rating IP54, NEMA 3R

Vibration Isolation Anti-vibration mounts built in

Dimensions (LxWxH)

Generator or Battery Box Module: 146cm x

120cm x 173cm

Fuel Tank Module: 298cm x 120cm x 53cm

Dual Module with Tank: 298cm x 120cm x 226cm