



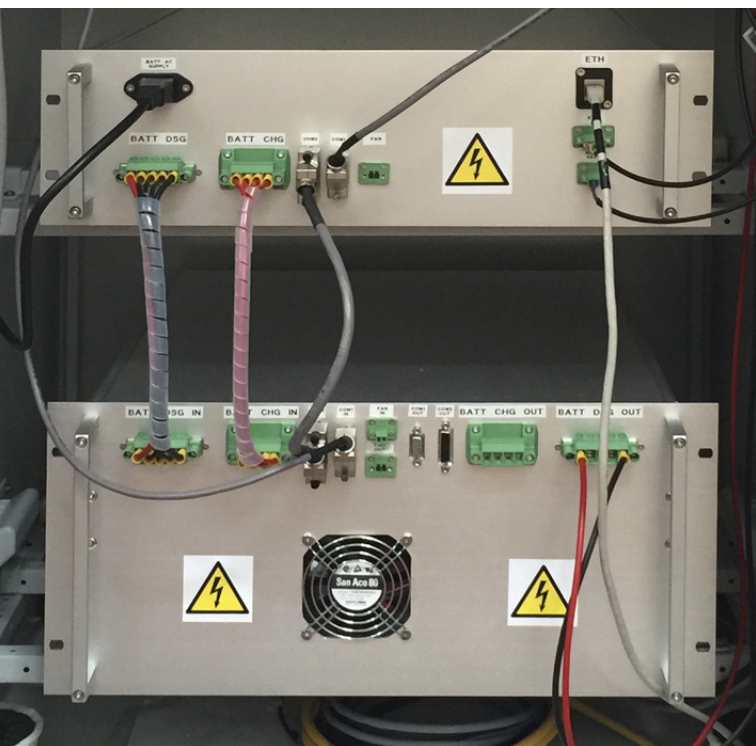
geniol[®]
battery energy
storage series

Geniol[®] Battery Energy Storage Series

GENIOL[®] is a modular lithium ion rechargeable *Battery Energy Storage System (BESS)* designed to be a longer-lasting replacement of lead acid batteries.

It can be used as backup power for *Base Transceiver Station (BTS)* as well as a configurable energy storage unit suitable for Renewable Systems (RES).

Its high energy density, long life, broad operating temperature range and multiple independent safety features improve performances and reduce total cost of ownership (TCO) for telecom, industrial and residential applications.





Applications

- LTE Wireless and Wi-MAX grid outage backup
- Residential, Hospital, Commercial Smart Energy Storage
- Off-grid Agriculture Power Sources
- Military, Emergency Energy Storage Deployment
- Smart grid stabilization
- Distributed Energy Storage Application

Main Features

- Compact 19" rack mountable
- Multiple Charge Option AC/DC
- Modular concept for increased scalability and redundancy
- Improved reliability in off-grid
- Zero environmental emissions, reduced lifecycle footprint
- Reduced weight and dimensions
- Optimized CAPEX
- Lowest off-grid Cost of Energy
- Simple installation, reduced maintenance
- Scalable, modular
- Improved renewable power factors
- Increase overall micro-grid resilience
- Improve quality power
- Superior Li-ion battery technology
- Cell design with multiple, independent safety features
- Excellent calendar and cycle life
- Round trip efficiency greater than 95%
- Sophisticated Battery Management System implemented both at module and system levels
- Predictive energy management embedded into GenScada System
- Web monitoring, remote diagnostic and maintenance thru (GenScada System)
- Extremely low maintenance
- Plug & play installation

Battery Management System (BMS)

- Three battery management levels: battery module and battery system
- Full array of programmable protection features: voltage, current and temperature

- State of Charge measurement with better than 1% accuracy over battery life time Lifetime data logging
- Alarms and faults managements
- State of Health
- Battery module charger embedded
- Passive cell balancing at module level
- Modbus serial bus communication between all battery modules and to the system level battery management
- Active balancing of state of charge between modules
- Easy to use supervisory & control SW

Technical Specification

Nominal Specification @ +25°C

Nominal Voltage (Vdc)	51,10			
Capacity (0.2C) at +25°C (Ah)	62	124	186	248
Rated energy (0.2C) (Wh)	3.100	6.200	9.300	12.400
# Strings (3.100 Wh)	1	2	3	4

Mechanical Specification

Width (mm)	495			
Height (mm)	356	578	889	1.111
Depth (mm)	450			
Weight (Kg)	36	66	97	127

Electrical Specification @ + 25°C

Voltage Discharge Range (Vdc)	42 - 57			
Max Continuous Discharge Current (A)	30	60	90	120
Max Continuous Discharge Power (W)	1.710	3.420	5.130	6.840
Voltage AC Charge (Vac)	110 - 220 @ 50-60 Hz			
Voltage DC Charge (Vdc)	124 - 370			
Max Continuous Charge Power (W)	800	1.600	2.400	3.200
Max Continuous Charge Power (W) - Optional	1.550	3.100	4.650	6.200

Operating conditions

Operating temperature	-20 to 60 °C
Round trip efficiency	>95%
Calendar lifetime at +25°C	>10 years
Cycling lifetime at 80% DOD	>10K cycles
Cooling	Forced convection
*Weight @ standard charge	

Safety

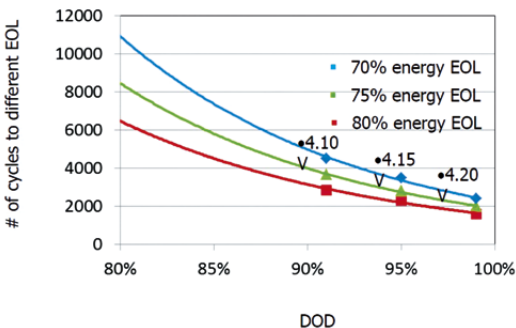
Redundant and independent safety features at cell level (Current Interrupt Device, twofold vents), at module level (logic fuse, voltage, current, temperature and balancing) and at system level (fuse, contactor, current sensor and disconnect switch).

Storage conditions	
Storage temperature	-40 to 60 °C
Storage time	6 month
Maximum altitude	3000 m a.s.l.
Maximum relative humidity	95% n.c.

Compliance to international standards	
Cell safety	UL 1642; IEC 62133
Electrical safety	IEC 60950
EMC	EN 300386; EN 61000
Environment	ETSI 300019
Marking	CE
Transport	UN 3480

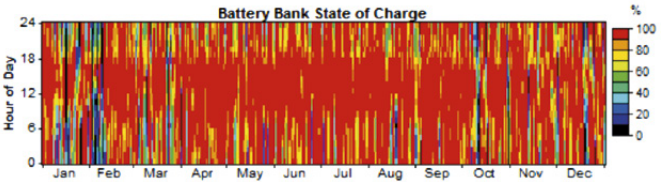
Cell Cycle Life

GENIOL 3100 guaranties the highest lifetime by controlling the optimal end of charge voltage and depth discharge (DOD). Therefore, the Total Cost of Ownership (TCO) of GENIOL 3100 is lower then traditional Acid Lead Batteries.



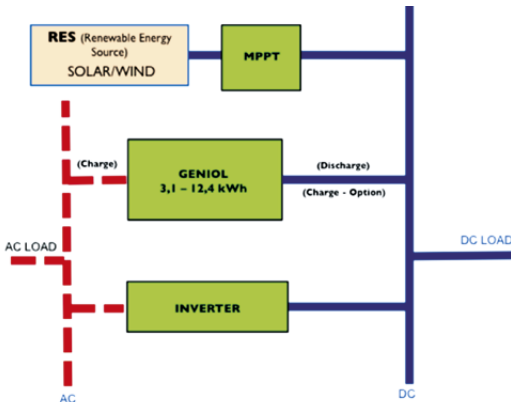
Distributed Battery Energy System

- Centralized, Remote Management, Local Slave Management embedded into smart inverter.
- Modular and scalable configuration up to dynamic and controlled requirements of grid parameters (V, f).
- Distributed architecture vs. centralized maximizes reliability and safety
- GENIOL modular concept enables flexible cost structure



Off Grid Hybrid Power Source

- Configurable Energy Module based on local statistical environmental irradiation and wind speed conditions allow to reduced CAPEX
- Reduced Levelized Cost of Energy (LCOE) due to GENIOL long lifetime and high Round Trip Efficiency





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