

THE MERCURIO HYBRID SYSTEM



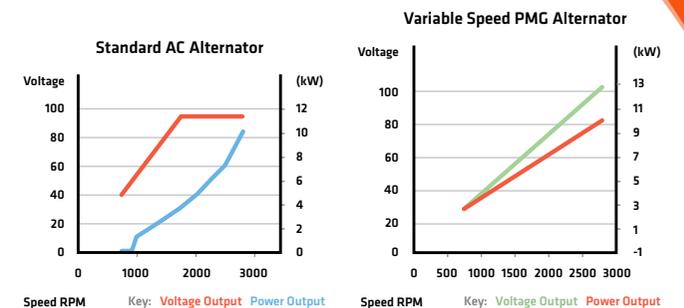
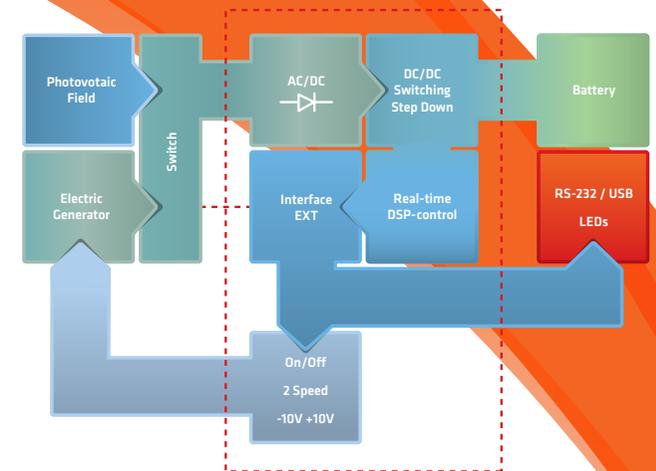
Mercurio 5 module with optional display

Mecc Alte has developed an innovative DC power converter which, coupled with a Mecc Alte AC alternator, will deliver a quality DC power output customised to suit cell tower systems. The Mercurio system converts the AC output of a Mecc Alte generator to DC power whilst functioning as an alternator and genset supervisor. This enables it the ability to stop and start the genset system. It works with fixed, twin or variable speed control systems. It can also control AC or DC inputs from other devices such as the grid and renewable power sources like solar panels or micro wind turbines.

The Mercurio power converter uses established and robust electronics to deliver an extremely clean DC power supply to Base Transceiver Station loads and battery systems for the telecoms industry. The benefits on fuel saving, and longer engine life, is key to the concept, but benefits also with variable AC input and genset control integrations.

The system is based on a rotating generator which can be either a Conventionally Rotor Wound [CRW] generator with power converter, or based on Permanent Magnet Generator [PMG] technology. The Conventionally Rotor Wound system offers several benefits; it offers the winning choice in case of cost per kW optimisation; in addition, spare parts and design footprints match existing Mecc Alte products, ensuring consistency of spares and proven reliability. A Permanent Magnet Generator system can meet unrivalled levels of efficiency, although outlay costs are much greater and systems are more costly and complex.

The greatest benefit of the Mercurio system comes from the simplicity of implementation. The system is designed to manage through programmable delays all the power transients that may be necessary during the genset start up. The power delivered by the Mercurio depends on the amps drawn by the batteries plus the power from the directly-connected DC load to the Mercurio. Speed is controlled by the Mercurio to the genset to deliver the requested power at any point in the load cycle.



TECHNICAL FEATURES ARE AS FOLLOWS:

DC-120VAC (L-N or L-L) input from multiple sources such as the generator, grid and PV. Third relay controls the switch between renewables and fossil fuel genset.

Modular design with base unit at 5kW and modules for 10 and 15kW

20-75VDC output voltage

<1% volt ripple on DC output

100A output for each module

92.5% efficiency 75% rated output

Signal to start and stop the genset (relay 230V 30A max)

Binary Signal to trigger between high power status for the fast recharge (high speed for the engine) and low power status for the trickle charge (low engine speed for fuel consumption minimisation)

Programmable power delay on dual and variable speed working condition to cope with the sudden power increase demand on the system idling on low speed. This allows the engine speed to increase to accept the high load.

Programmable monitoring of battery charge state

Engine speed control via -10 to +10VDC range programmable analogue signal to engine governor or actuator (engine governor and/or actuator is not supplied by Mecc Alte)

RS232 connection for remote operation

I/O for alarm and running status

Smart battery charger with battery temperature probe and dual current sensing (load/battery)

Advanced battery management, hardware jumpers to force a recharge cycle and to inhibit the recharge overnight

Emergency mode as a voltage generator.

Load is power supplied during battery service.

Automatic MPPT optimiser for solar power usage

Protection for:

- Battery reverse polarity
- Short circuit
- Vmax
- Imax
- Over temperature

Operating temperatures of -25 to +55°C

IP65 metal enclosure with forced ventilation

Various manufacturers' options (not fitted as standard):

- Supervising display

EFFICIENCY MEASURED

Current [A]	Eff. [%]
10	81.1
25	90.0
50	92.5
75	91.9
100	91.3



Models	Mercurio 5	Mercurio 10	Mercurio 15
Input			
Voltage Range (Phase)	35 ÷ 120V		
Max. Current (Phase)	50A	100A	150A
Range of Frequency	DC ÷ 400Hz		
Output DC			
Voltage Range	20-75V		
Nominal Voltage	12-60V		
Max. Current	100A	200A	300A
Rated Power	5,000W	10,000W	15,000W
Ripple	<1%		
Performance			
Operating Temperature Environment	-25 ÷ 55°C		
Max Temperature Heat Sink	80°C		
Max Efficiency	92.5%		
Protection			
Over Temperature	Yes/derating		
Overload	Yes/derating		
Overvoltage	Yes		
Short Circuit	Yes		
Battery Inversion	Yes		
Ventilation	External		
Data			
Dimensions (H W D)	290x370x400mm	290x670x400mm	290x970x400mm
Weight	~20kg	~40kg	~60kg
IP Protection	65		
Interface & Communication			
Interface	RS232		
Visual Indication	LEDs – connection point for remote LED indicators supplied by others		
Relay	3 x 230V 30A		
Isolated Output Voltage	-10 / +10V (adjustable range)		

Power limitation. If you use with DC input, you are limited of max current input (35A for the size 5kW). You can get up to double the current if you use all the inputs.