

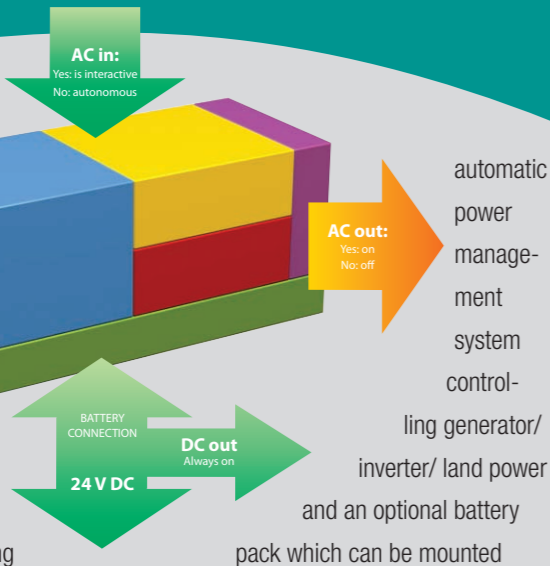
TIME FOR A CHANGE

The new GENVERTER range of Hybrid Generators is the ultimate solution to stop unnecessary waste of energy while reducing costs of ownership at the same time. Hybrid solutions have become common in various industries nowadays, with the GENVERTER range we introduce the first hybrid “green power source” for domestic and mobile markets.

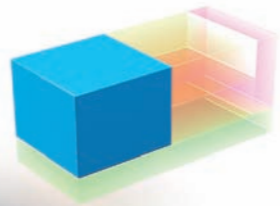
How it works

The new GENVERTER generation is the perfect synthesis of a modern diesel engine with the alternator incorporated into the flywheel. A bi-directional switch mode sine wave inverter operating as a three step battery charger when land power is connected or generator is running, an

- Low emission, super quiet, liquid cooled diesel generator
- Silent inverter offering “ac from the battery”
- Includes ups back-up power function
- Battery charger inside for quick re-charge
- Power Tower Lithium Ion battery stack optional
- Superior 230 V/50 Hz sine wave power quality
- Boost function in case 230 V 50 Hz land power is weak



automatic power management system controlling generator/inverter/ land power and an optional battery pack which can be mounted below the generator. Like in a hybrid car, the whole system controls itself at low power consumption (230 V/50 Hz or 12/24 VDC) the battery/ inverter will operate the connected appliance. When power demand increases, the diesel generator will start automatically, at low demand the running speed of the engine will be low, at higher demand the speed will increase (rpm between 2200 and 3600 rpm) Clean, sine wave output with extremely low distortion is guaranteed as the inverter is acting as the final stage (compare with an on-line UPS system). Peak power capability is extremely high (200%). The important BOOST function reinforces the AC output in case of a weak utility/ land line, allowing inductive appliances like airconditioning systems to start smoothly. With the comprehensive monitoring and control panel, the operating mode (like quiet time –only running time during night hours for example) can be customized to the user’s needs.



Liquid cooled diesel engine with integrated permanent magnet fly wheel generator



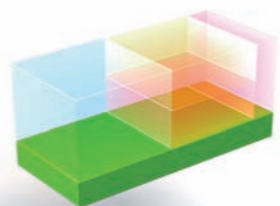
5 kVA sine wave inverter offering 10 kW peak power, switch mode technology, > 93% efficient



3 - stage battery charger to charge the 24 VDC (or 12 VDC) back-up battery



Transfer switch utility/ landpower - inverter for automatic 230 VAC source selection



Connection to the 12 or 24 VDC auxiliary battery: either integrated (PowerTower) or separate

“LONG LIFE” DEEP CYCLE BATTERY PACK

The GENVERTER systems marked with an “i” are prepared for connection to an external battery bank. Any battery can be used: open lead- acid, sealed lead-acid, GEL, AGM, traction/ semi traction, etc. Users who are interested in a turn-key “one system” solution are offered a high value battery pack, functioning as the mounting chassis for the whole system at the same time. We have selected the latest Lithium Ion battery technology, offering enormous advantages. Space requirement is 3 times less, weight saving is at least 3 times and battery cycle life is at least 3 times longer compared with lead acid deep cycle batteries.

Until recently, Li-ion batteries were used in small tools, laptops, mobile phones, electrical bicycles and so on. High power density, long life time , extremely high cycle life and optimized safety for the user are the hallmarks of these batteries. We are now offering a “POWERTOWER” of 24 V / 220 AH (extendable), capable to provide high currents (200% of nominal capacity) or accept a high charge current (200% of nominal capacity).

The POWERTOWER is a pre-fab ready-to-use product,



- A robust steel enclosure with mounting chassis for the GENVERTER
- 220 Ah/24 VDC Li-ion (LiFe PO4) battery, suitable to operate from 20°C - + 55°C
- Individual Cell Charge Management BMS to control battery charging and discharging in a balanced way, includes overcharging/ discharging protection
- LCD display with individual cell read-out
- CAN communication connection

The company

WhisperPower is one of the leading manufacturing and design companies in the world in the field of high class power generation systems. We design and manufacture marine products in close collaboration with leading power systems companies. In the various commercial and recreational mobile and domestic fields we offer our products and systems under our own WhisperPower brandname. Research and development, manufacturing, distribution and after sales service is carried out in our 5500 m2 company building in Drachten, in the North of the Netherlands. Sales, service and support is covered by our extensive network of technical sales partners.



GENVERTER. THE NEW **HYBRID** DIESEL GENERATOR / INVERTER COMBINATION

Unique 1 cilinder diesel engine, complying with the highest emission standards, designed by WhisperPower, operating as the smooth "Power Source" of this 5 kW GENVERTER system.

Permanent magnet fly wheel alternator (PM) > 94% efficient

< 52 dBa audible noise

1 cilinder WhisperPower designed diesel engine, liquid cooled

Plug and play installation, pre-fab connections

variable speed - smart power control

Sine wave inverter for "silent mode"

3-stage battery charger for 24 or 12 VDC



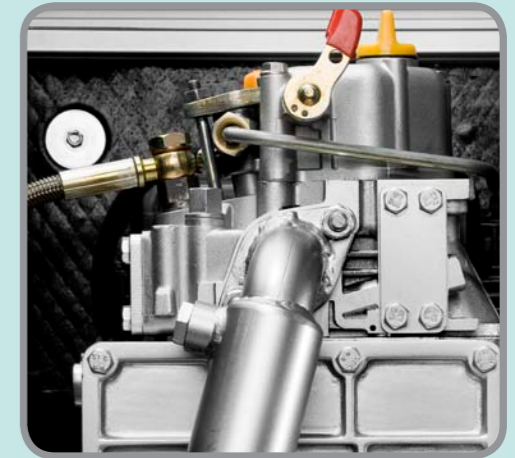
Unique 1 cilinder diesel engine, complying with the highest emission standards, designed by WhisperPower, operating as the smooth "Power Source" of this 5 kW GENVERTER system.



Connections to make the engine operational have been pre-installed: oil line IN/ OUT (to radiator), and diesel fuel IN/ OUT. This is also the side to connect the external exhaust system to the engine. At the other side of the GENVERTER all electrical connections have been concentrated.



Smart electronic regulator adjusts engine speed to the AC and DC power consumption: high revolutions in case of high energy demand, low revolutions at low energy demand up to "switch-to-inverter", silent power interval.



GENVERTER's diesel engine is following an unique cooling principle. The engine is oil-cooled in stead of air cooled, which reduces the audible noise of the system considerable. The oil is distributed along the cylinders and the cylinder head. A small, external radiator keeps the oil temperature at the right, constant temperature.





Flywheel of the 1 cylinder diesel engine is converted into a power generator, delivering unregulated power to the inverter. This permanent magnet, variable speed "pan cake" alternator is extremely efficient (94%) and powerful, and acts as the starter motor at the same time (dyna-start)



Electrical connections are concentrated at one side. Positive and negative connectors for the battery, AC voltage/ Input and AC voltage/ Output, Masterbus/ CAN-bus connections, remote connections etc.

THE RANGE				
During Autumn 2009, our W - GV 5 model will become available, offering 5 kVA 230 V 50 HZ VAC power and 12 or 24 VDC power.				
We offer "full hybrid" versions, with battery / silent mode and "semi-hybrid" versions, without "silent mode".				
All versions are based on a 1 cilinder liquid cooled WhisperPower diesel engine and a 5 kVA sine wave inverter / battery charger.				
Model	Power rating	Inverter / charger	DC voltage	Enclosure
W - GV 5i	5 kVA / 230 V	5 kVA / 100/200 A	24 V or 12 V	One cabinet*
W - GV 5i	5 kVA / 230 V	5 kVA / 100/200 A	24 V or 12 V	Modular
W - GV 5	5 kVA / 230 V	4 kVA / N/A	N/A	One cabinet
W - GV 5 DC	150 A / 24 V	150 A / N/A	24 V	One cabinet*
*) Optional: Lithium Ion battery pack (see below)				
TECHNICAL SPECIFICATIONS GENVERTER W - GV 5 / 5 kW POWER SYSTEM				
	W - GV 5i	W - GV 5	W - GV 5 DC	
	Art. no. 41001000 / 24 VDC	Art. no. 41002000	Art. no. 41003000	
	Art. no. 41001500 / 12 VDC			
AC SYSTEM SPECIFICATIONS				
System output continuous / 230 V 50 Hz	5 kW	4 kW	150 A	
Silent mode continuous / 230 V 50 Hz	2 kW AC (inverter)	N/A	N/A	
Peak power (5 sec)	10 kW	10 kW		
Output voltage	230 VAC +/- 5%	230 VAC +/- 5%	24 VDC	
Frequency	50Hz +/- 1%	50 Hz +/- 1%	-	
AC output voltage / frequency	230 V / 50 Hz	230 V / 50 Hz	24 VDC	
Max Surge current (5sec)	45 A	45 A	-	
Output waveform	Pure sine wave	Pure sine wave	DC power	
Parallel use (multiple systems)	Yes	No	Yes	
Parallel with land power / utility	Yes (BOOST function)	No	No	
Total harmonic distortion (nom use)	<5%	<5%	-	
Leading or lagging power factor	All power factors allowed			
Inverter efficiency (no load)	93%	93%	-	
DC SYSTEM SPECIFICATIONS				
Battery voltage	24 V or 12 VDC	-	24 V	
Battery Charging current	100 A (adjustable) / 200 A 12 V	-	150 A (adjustable)	
Input voltage battery charger / land line	180 - 265 VAC	-	-	
Charge characteristic	3-step, temp. compensated	-	3-step, temp. compensated	
Primary consumption / AC input	3000 VA	-	-	
Suitable batteries	Open lead/gel/AGM/Lithium-Ion	-	Open lead/AGM/Gel/Lithium-Ion	
Recommended battery capacity	>200 Ah	-	>200 Ah	
Max DC current	550 A 24 V (800 A 12 V)	-	-	
DC Fuse	y	y	y	
Min DC cable size	2 x 70 mm ² (12 V 2 x 90 mm ²)	-	2 x 70 mm ²	
No-load battery consumption silent mode	10 Watt	10 Watt	10 Watt	
ALTERNATOR SPECIFICATIONS				
Type	Brushless Permanent Magnet Alternator, combined with fly wheel			
Continuous rated power 3000 rpm	3.3 kW	3.3 kW	3.3 kW	
Peak power rated at 3600 rpm	3.9 kW	4.5 kW	3.9 kW	
Efficiency	94%	94%	94%	
RPM	2200 - 3600	fixed, 3 positions	variable speed	
AUTOMATIC TRANSFER SYSTEM LAND POWER / INVERTER				
Transfer time	10 - 20 ms	-	-	
Max current	50 A			

	W - GV 5i	W - GV 5	W - GV 5dc
	Art. no. 41001000 / 24 VDC	Art. no. 41002000	Art. no. 41003000
	Art. no. 41001500 / 12 VDC		
ENGINE SPECIFICATIONS			
Engine design & manufacturing	WhisperPower	WhisperPower	WhisperPower
Number of cylinders	1	1	1
Cylinder capacity	300 cc	300 cc	300 cc
Air consumption	0,42 m ³ /min	0,42 m ³ /min	0,42 m ³ /min
Engine cooling	oil cooled / oil cooler	oil cooled / oilcooler	oil cooled / oilcooler
Fuel consumption	1,2 l/hr - full load	1,2 l/hr - full load	1,2 l/hr - full load
Pump capacity (oil)	10 l/m	10 l/m	10 l/m
System cooling	by external radiator or oil cooler	by external radiator or oil cooler	by external radiator or oil cooler
Governing system	electronic	electronic	electronic
Fuel Lines (supply and return)	8 mm inner diameter	8 mm inner diameter	8 mm inner diameter
Dry exhaust diameter	Ø 1"	Ø 1"	Ø 1"
Fuel	ASTM diesel fuel	ASTM diesel fuel	ASTM diesel fuel
Bio fuel	at request	at request	at request
ENCLOSURE			
Dimensions (h x w x d) in cm	50 x 45 x 65 cm	50 x 45 x 65 cm	50 x 45 x 65 cm
Material / colour	sheet metal / white RAL 9003	sheet metal / RAL 9003	sheet metal / RAL 9003
Weight (Dry weight)	80 kg	70 kg	80 kg
Temperature range operational	-20° to 40°C above 40°C de-rating of 3%/°C		
Protection degree	Engine enclosure IP 44, Electronic enclosure IP 23		
Relative humidity	Protected against humidity and condensing air by conformal coating on both sides of all PCB's		
	Max 95% relative humidity, none condensing		
Audible noise running mode	< 67dB @ 3m	< 67 dB @ 3m	< 67 dB @ 3m
Audible noise silent mode	NC-30	-	-
AC & DC CONNECTIONS			
AC connection output	Terminal block with 5 m cable conn.		N/A
AC connection input	Terminal block with 5 m cable conn.	N/A	Terminal block with 5 m cable conn.
Low Voltage DC connections	Terminal block		
Communication ports	Masterbus: 2 x R J45 / Various CAN protocols		
Temperature sensor	RJ 11, to be sticked to the battery	N/A	RJ 11, to be sticked to the battery
Battery current sense input (shunt)	Phoenix combicon	N/A	Phoenix combicon
Alarm (potential free contact)	Phoenix combicon	N/A	Phoenix combicon
Switch off non preferent AC group (potential free contact)	Phoenix combicon	N/A	N/A
OPTIONAL			
	Li-ion battery pack 24 VDC / 220 Ah, plug and play, ready to use, pre-wired		
	Radiator / oil cooling kit for external mounting (required for mobile / domestic use)		
	Exhaust system kit with muffler		
	Fuel kit		
	Various spare part kits		
MONITORING & CONTROL			
For all models the Digital Control Panel (remote) is supplied a standard. Advanced touch screen 8.4 inch system panel is optional.			
			

KEY FEATURES

- ▶ At least 30% fuel reduction
- ▶ Extremely quiet due to variable speed technology
- ▶ High class low emission diesel engine “made for the purpose”
- ▶ substantially smaller and lighter due to combined switch mode/ fly wheel alternator technology.
- ▶ Modular version will fit in any space
- ▶ Strongly reduced maintenance costs
- ▶ Plug and play installation, pre-fab connections
- ▶ Remote access for service and support
- ▶ Can bus/masterbus connectivity
- ▶ One stop shop



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small in one
power box

HYBRID