



USER MANUAL

WhisperPower

Power Module Genverter

WP-PMG 4kW



WP-PMG 4kW

Pure sine wave from your generator



- Excellent choice to replace traditional gensets
- 4kW continuous 230V power from your variable speed generator system
- High efficiency and strong peak power
- Outstanding voltage stability
- Saving fuel and ensuring smooth running of your genset
- Genverter Power, the best choice for your energy supply

1. INTRODUCTION

Thanks for choosing our product. The Power Module for Genverter (WP-PMG) is an essential link between your WhisperPower Genverter and your AC electrical system. WhisperPower Generators are state-of-the-art systems using very compact and highly efficient Permanent Magnet alternators to produce electric power. Unlike traditional fixed speed generator sets, however, Generators may produce output voltages up to 350VAC with frequencies as high as 400Hz. This is where the WP-PMG comes into play, using advanced power electronics to produce a stable sinusoidal AC voltage at 50Hz, as required by regular 230V appliances. Safety is enhanced by WP-PMG's capability to blow fuses when a short-circuit occurs.

Use of this manual

This manual serves as a guideline for safe and effective installation, as well as correct operation, maintenance and, if necessary, troubleshooting of the WP-PMG.

It is recommended to keep the manual in good condition for future use. It should be kept in a dry and clean place, and available any time.

General precautions

To ensure safe and sustainable operation of the WP-PMG, the handling and safety instructions detailed in this manual shall be followed at all times. Every person working on or with the WP-PMG should be familiar with the contents of this document. Also bear in mind that all applicable (safety) standards and (local) regulations shall be followed at all times.

Furthermore, only qualified and authorized technical experts are permitted to perform maintenance activities which require opening the system.

IMPORTANT!

Throughout this manual, the following alert symbol is used to indicate potential hazard:



CAUTION / WARNING!

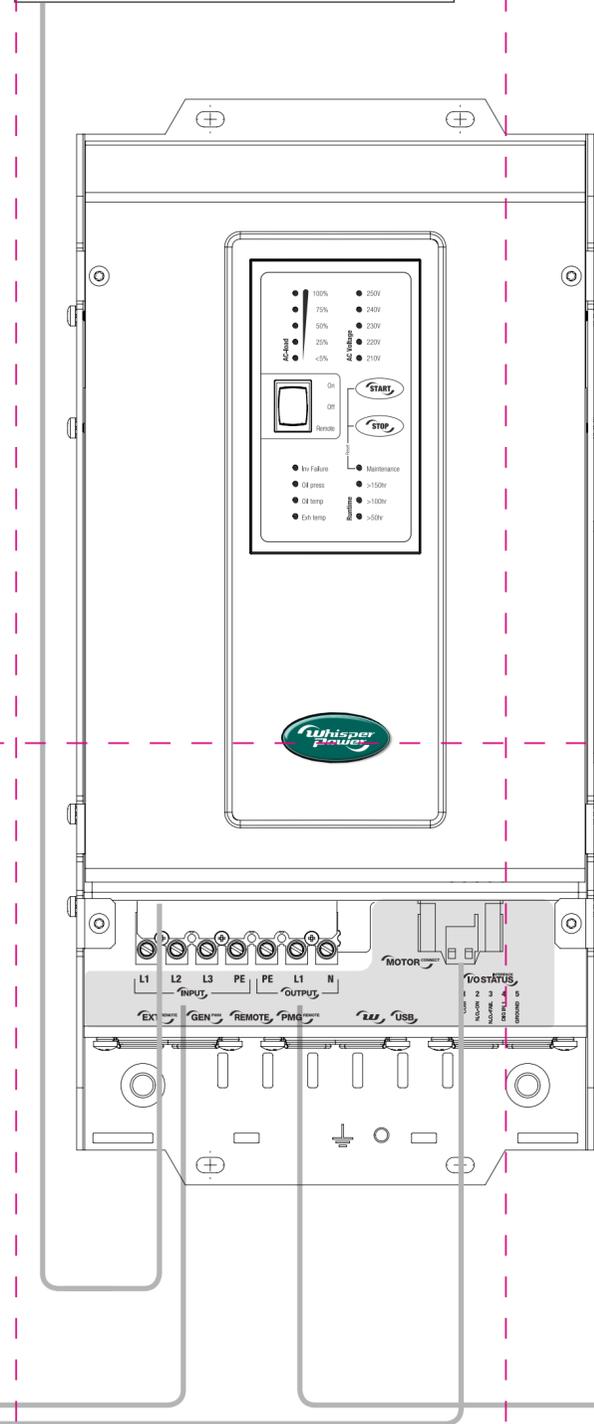
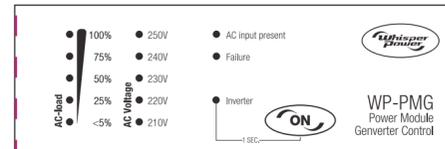
Risk of equipment damage or personal injury. Always be aware that your actions may have an impact on safety and/or on product performance. Carefully follow instructions documented.

2. INSTRUCTIONS FOR USE



CAUTION ! Risk of fire, electric shock and/or equipment damage

- The WP-PMG was designed for dry and clean environments.
- Do not expose it to dust, rain, snow or liquids of any type.
- Do not smoke near the WP-PMG.
- To prevent overheating, DO NOT block ventilation.
- Do not place any inflammable materials near the WP-PMG.
- Verify the condition and connection of all cables on a regular basis.



Operation

The local control panel power switch offers (apart from the "Off" mode) two working modes: "On" and "Remote".

Select the "On" position to enable both the WP-PMG and the Genverter.

With the switch in the "Remote" position, the WP-PMG can be operated by means of the remote panel (as presented above). In other words, the unit can be switched on and off both from the remote panel and on the unit itself.



Once the WP-PMG has been switched "On", use the "START" and "STOP" button to switch the Genverter on and off.



Note: press and hold for 2 seconds !



Use the "START" and "STOP" buttons simultaneously to be able to reset the runtime measurement functionality (indicating when next maintenance is due).



● Maintenance

When the Genverter is started, the control panel LEDs will provide various types of operating information:

CONTROL PANEL INFORMATION	
AC Load	A series of five LEDs showing the WP-PMG's output as a percentage of its rated output. If all five LEDs start blinking, the WP-PMG is overloaded and may shut down at any moment.
AC Voltage	A series of five LEDs showing the WP-PMG's approximate output voltage. In a range from 210V to 250V, the 220V or 230V LED will typically light up. When LED "210V/WAIT" is blinking, the system wait for a user command. When LED "220V/TILL" is blinking, the generator is in Till mode. When LED "210/WAIT" is blinking, the engine is cranking.
Alerts	Series of four LEDs alerting in case of: <ul style="list-style-type: none"> - inverter failure - high oil pressure - high oil temperature - high exhaust temperature
Runtime	Series of three LEDs indicating the WP-PMG runtime since last maintenance.

3. TROUBLESHOOTING

The table below lists possible failure conditions. If the failure LED illuminates, switch off the WP-PMG, adopt the applicable solution(s) and switch the WP-PMG on again.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Inverter failure LED illuminated	Ambient temperature is too high	Move the WP-PMG to a colder position, or reduce the load
	Ventilation is blocked	Improve ventilation
	AC input is out of range	Check generator output voltage and frequency, and correct if necessary
Oil pressure LED illuminated	Too many or too heavy AC consumers	Reduce the load
	Oil leakage	Contact WhisperPower Service centre
Oil level too low	Oil level too low	Refill
	Oil temperature LED illuminated	Insufficient cooling
Exhaust temperature LED illuminated	Load too high	Reduce load
	Too rich fuel	Contact WhisperPower Service centre

4. INSTALLATION

General Remarks

Local and/or special regulations may apply depending on the type of installation involved. It is essential that each and every circuit in the electrical system is properly installed by a qualified electrician using all applicable standards.



CAUTION !

Risk of electric shock, personal injury, explosion and/or equipment damage

- Do not work on the WP-PMG or the electrical installation while it is still connected to a power source.
- Never connect the inverter output to a 230V connection of the public grid.
- All electrical safety/shutdown and circuit breaking systems have to be installed separate from the WP-PMG.

In Europe, pleasure craft smaller than 24 meter is subject to the EC Recreational Craft Directive, which refers to EN ISO 13297:2012 (Small craft - Electrical systems - Alternating current installations).

When installing a 230V system on a vehicle, be aware that people are not used to having such systems on a vehicle. Put warning signs on wall sockets and on junction boxes. Instruct non-regular users of the vehicle. Warn maintenance personnel of garages servicing the vehicle.

Grounding

The housings of the Genverter and of the WP-PMG are grounded by means of the green/yellow wires in the Genverter and output cables. Making a connection between "neutral" and "ground" of the AC 230V output could be necessary as part of a specific insulation failure protection system. This should only be done by experts when installing such a system.

For vehicles, methods of protection are subject to rules that may vary depending on the use of the vehicle and local standards. Experts in this field should be consulted.

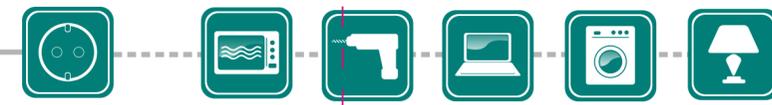
Transfer Switching

When a connection to the public grid is required, a power source selector must be installed between the WP-PMG and the vessel's/ vehicle's electrical system. This so-called transfer switch is an essential safety device allowing all AC consumers to be switched off simultaneously and separating the WP-PMG output from the grid. WhisperPower recommends the installation of a WP AC Transfer System Switch. By default, this uses grid input. When it detects WP-PMG input, it automatically switches over to generator input after 10 seconds delay time. Even more advanced, a WP Whisper-Switch allows simultaneous input from the Genverter and the grid. Refer to the applicable product instructions.

Location

When looking for a proper position for installing the WP-PMG, all relevant aspects have to be taken into account, in particular:

- The WP-PMG must be installed in a dry and clean place protected from strong vibrations. Do not expose the WP-PMG to dust, rain, snow or liquids of any type. The input being three-phase alternating current, the WP-PMG can be installed at some distance from the Genverter.
- Ensure that ventilation airflow is not obstructed in any way. Keep a free space of 200 mm around the unit.
- The unit's control panel must remain accessible.
- The WP-PMG contains components capable of producing arcs or sparks. To prevent fire or explosion, do not install the unit in compartments containing batteries or flammable materials or in locations requiring ignition protected equipment. Moreover, gases from batteries will corrode and damage the WP-PMG.



List of Materials

The delivery includes the WP-PMG and a WhisperPower remote control panel with its 5 m RJ12 connecting cable. 10 m and 15 m cables are available on request.

Additional materials required:

- Screws / bolts (4 × Ø 6 mm, with plugs if necessary) to mount the unit to a wall.
- A sufficient number of short-circuit proof clamps.
- Cable lugs (7) for connecting the various 4 mm² wires.
- Cable ties, for securing the input and output cables (at least 4, e.g. 140 mm × 3.5 mm).
- An output cable, i.e. any cable of appropriate rating and length to accommodate the application.
- A slow-reacting output fuse (32A recommended).
- If another 230V source may be available, a transfer switch.

STEP 1: Mounting the unit

- Determine the bolt / screw positions.
- Turn the screws / bolts (Ø 6mm) into the wall but do not tighten them entirely.
- Place the housing over the screws / bolts.
- Fix the housing by fastening the screws securely.

STEP 2: Connecting the Genverter cable

The Genverter cable (e.g. 4 × 6 mm²) shall be installed using short-circuit proof clamps.

Remove the cover protecting the terminals by unscrewing the two tapping screws. Provide the Genverter cable wires with lugs and connect the wires to the input terminals as follows: brown to L1; black to L2; grey to L3; green/yellow to PE.

Use cable ties of sufficient strength as a strain relief.

MOTOR CONNECT

Connect the 5-pin motor control cable to the motor control connector.

STEP 3: Connecting the output cable

A slow-reacting fuse (32 A recommended) should be installed to protect the installed electrical system. Make sure there is a Residual Current Device between the WP-PMG and any on board AC equipment.

Provide the output cable wires with lugs and connect the wires to the output terminals as follows: green/yellow to PE; brown to L1; blue to N.

Use cable ties of sufficient strength as a strain relief.

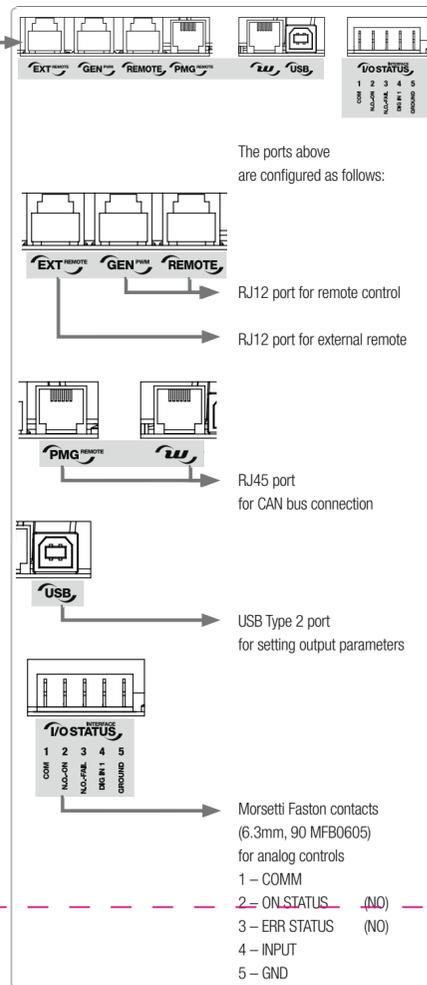
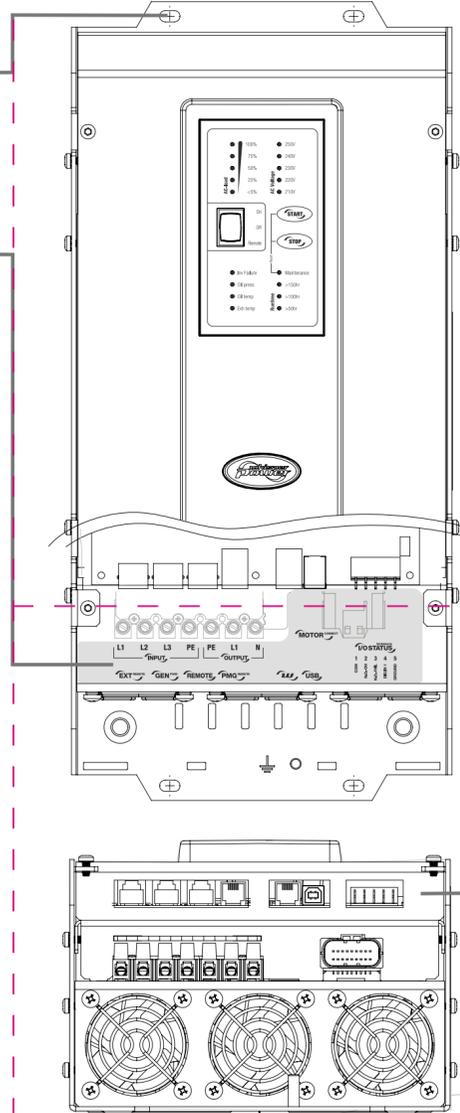
Replace the cover protecting the terminals and tighten the tapping screws.

STEP 4: Connecting the remote control panel (optional)

The WP-PMG has a local control panel, which is on the unit, and a remote control panel, the installation of which is optional (marine version shown).

The remote control panel can be mounted either on or in the dashboard. When the remote control is mounted on the dashboard, the back cover can be used as a drill template.

The connecting cable can exit in any direction through one of pre-shaped ports in the sides of the plastic case or through a hole in the dashboard. On the WP-PMG, the cable is plugged into the PMG REMOTE port.



5. SPECIFICATIONS

POWER MODULE FOR GENVERTER 4KW	
Article nr.	60201404
GENERAL SPECIFICATIONS	
Genverter model	Genverter 4
Output load	True sine
Output voltage	200 .. 240 VAC (nominal 230V)
Output voltage stability	+/- 5% (resistive load step 0 .. 100%)
Output frequency	45 .. 55 Hz (nominal 50Hz)
Frequency variations	< 1%
Output current	36A
Nominal apparent power	3500VA
Continuous power (cos phi = 1)	3500W
Peak power (15 min.)	4kW
Nominal efficiency (@ full load)	95%
Peak efficiency	97%
Input voltage	3 times 220 .. 350VAC
Input frequency	200 .. 400Hz
Max. input current	17A
Weight	5kg
Dimensions (h × w × d)	436 × 196 × 148mm
Mounting rectangle (h × w)	412 × 100mm
TECHNICAL SPECIFICATIONS	
Voltage THD (Total Harmonic Distortion)	< 3%
Short circuit protection	yes
Mean time between failure	10 years
Lifetime expectancy (@ 40°C and nominal load)	100.000 hours
Local read out module	Inverter status load bar, voltage and runtime (for maintenance purposes) indicator and failure detection notification
Remote panel (LED)	Inverter status load bar, voltage indicator, AC input present and failure detection notification
USB	For software parameter configuration
Potential-free status contact	Inverter enabled / disabled
Wire system	L1 - N - PE
Recommended cable cross input / protection fuse	4mm / 32A
Recommended cable cross output / protection fuse	4mm / 32A RCD
Remote panel connection	RJ12 twisted cable
Engine interface connection	Engine RPM request (pwm signal; optimal)
CONDITIONS	
Operating temperature	-20 .. 70°C (linear derating above 40°C)
Storage temperature	-40 .. 80°C
Relative humidity in operation/storage	Max. 95% non-condensing
Protection degree	IP23
Ventilation	Forced cooling (non-dependent)
COMPLIANCE	
Directives: EMC 2004/108/EC, LVD 2006/95/EC	
Standards: EN 55022 (emission), EN 61000-3-2 (harmonics), EN 61000-4-11, EN 61000-6-1, EN 61000-6-2 (immunity), EN 60945 (maritime navigation and radiocommunication), EN 60950 (safety)	

6. WARRANTY TERMS AND CONDITIONS

WhisperPower guarantees that the equipment has been built according to the legally applicable standards and specifications. WhisperPower assures the product warranty of the Power Module for Genverter during two years after purchase, on the condition that all instructions and warnings given in this manual are taken into account during installation and operation. The warranty is limited to the costs of repair and/or replacement of the product by WhisperPower only. Costs for installation labor or shipping of the defective parts are not covered by this warranty.

7. CE MANUFACTURER'S DECLARATION

We, WhisperPower BV, Kelvinlaan 82, 9207 JB Drachten, Netherlands, hereby declare that: Product: 60201404
WhisperPower-Power Module Genverter is in conformity with the following provisions of the EC: 2004/108/EC (EMC Directive), the following harmonized standards having been applied:
- EN 55022:2010 (Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement)
- EN 61000-3-2:2006 (Electromagnetic compatibility [EMC] - Part 3-2: Limits - Limits for harmonic current emissions)
- EN 61000-6-1: 2007 (Electromagnetic compatibility [EMC], Generic standards. Immunity for residential, commercial and light-industrial environments)
- EN 61000-6-2: 2007 (Electromagnetic compatibility [EMC] - Part 6-2: Generic standards - Immunity for industrial environments)
- EN 60945:2002 (Maritime navigation and radiocommunication equipment and systems)
2006/95/EC (Low Voltage Directive), the following harmonized standard having been applied:
- EN 60950: 2000 (Safety of information technology equipment)

Drachten,
M. Favot, C.T.O. WhisperPower B.V.ww

