



USER MANUAL WP-PMG



Power Module Genverter

Inverter for 8-12kVA PM Generator 230V/120V



- Excellent choice to replace traditional gensets
- 10 kW continuous 230V power from your programmable speed generator system
- Also available in 120V / 60Hz model (6kW) for W-GV8 or M-GV8
- 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

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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 Genverters 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, Genverters 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!

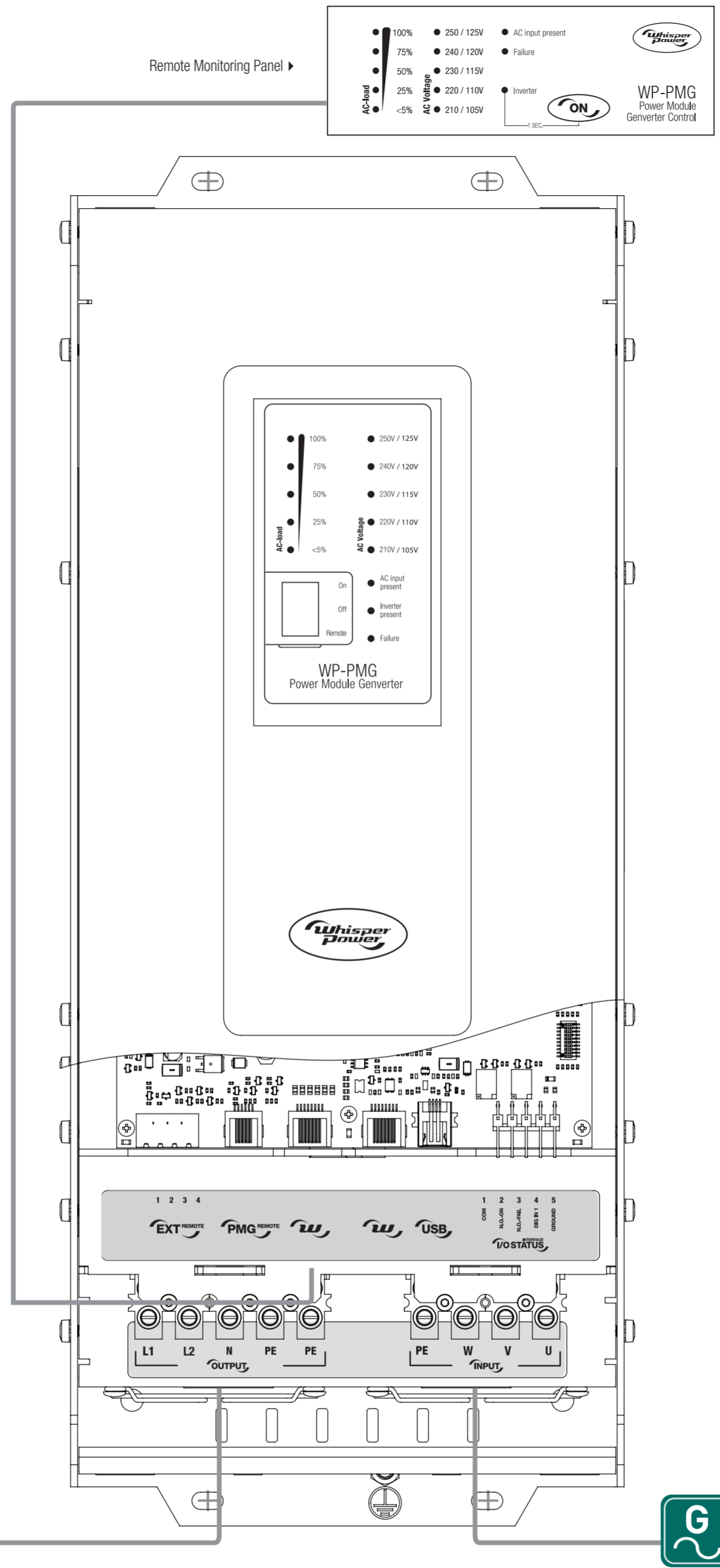
Risk of equipment damage or personal injury. Always be aware that your actions may have an impact on safety and/or on product performance. Carefully follow instructions documented.

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

Apart from the "off" position, the power switch offers two working modes: "on" and "remote". With the switch in the "remote" position, the WP-PMG is operated from a remote panel. In other words, the unit can be switched on and off both from the remote panel and on the unit itself. Under normal conditions, the unit is left switched "on", regardless of whether the Genverter is running or not. When the Genverter is started, the control panel LEDs provide various types of operating information:

CONTROL PANEL INFORMATION

AC input present	The Genverter is producing power and the WP-PMG is starting up.
Inverter present	The WP-PMG has completed starting up and is supplying 230VAC to your on board appliances.
Failure (red)	The WP-PMG failed to complete the start-up sequence or was shut down during operation. Refer to the Troubleshooting section.
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. For 120V model, the 115V or 120V LED will typically light up.

* With a two cylinder genverter, the output will not exceed 75% of the rated output.

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
The failure LED illuminates	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
	Too many or too heavy AC consumers	Reduce the load

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 WhisperSwitch 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.

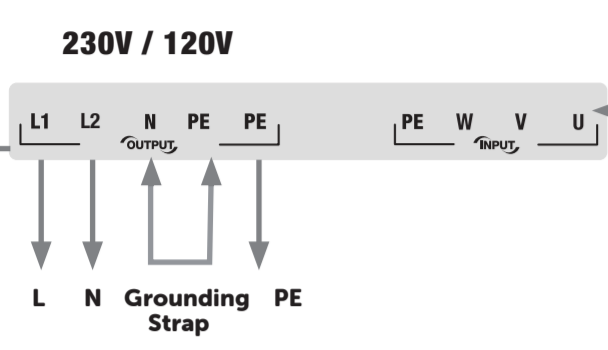
List of Materials

The delivery includes the WP-PMG and a WhisperPower remote control panel with its 10 meter RJ12 connecting cable. 5 meter and 15 meter cables are available on request. Before installing the WP-PMG, check if it was adjusted for a two or three cylinder genverter. Additional materials required:

- Screws / bolts (4 x 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 x 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 using.
- 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 x 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 three wires to the U, V, and W input terminals. The PE terminal is not used.

Use cable ties of sufficient strength as a strain relief.

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 L,
blue to N.
Use cable ties of sufficient strength as a strain relief.

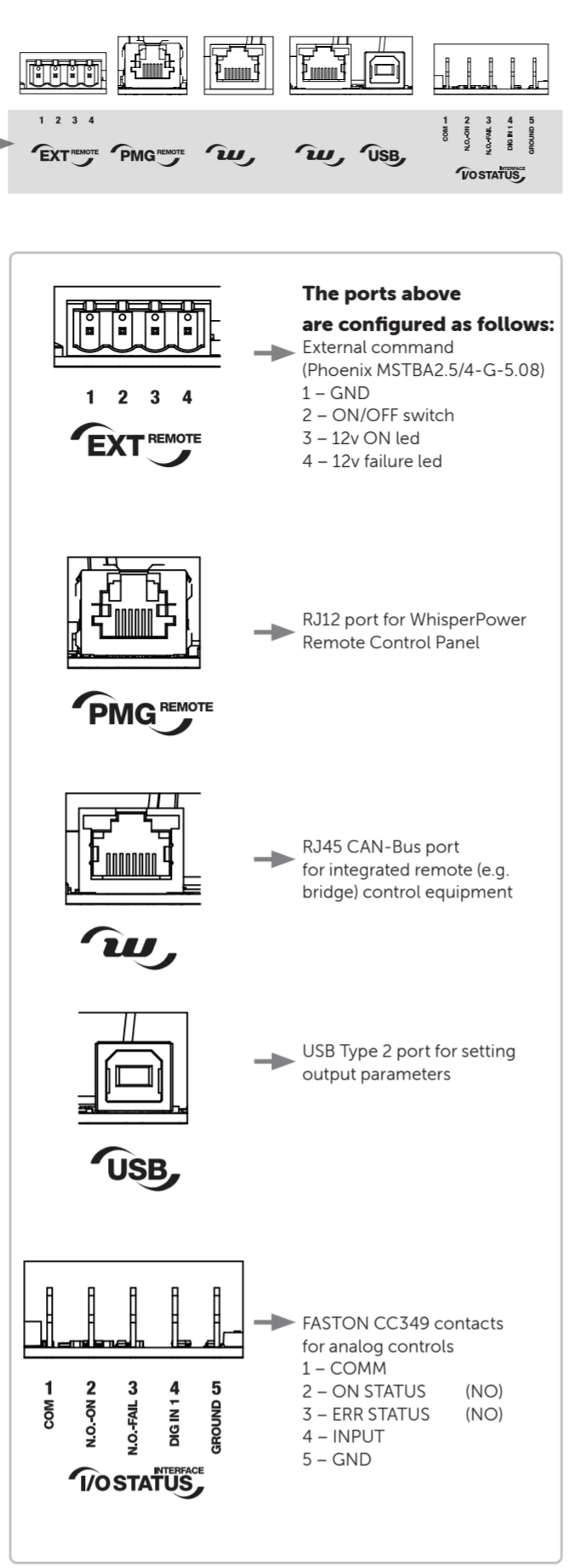
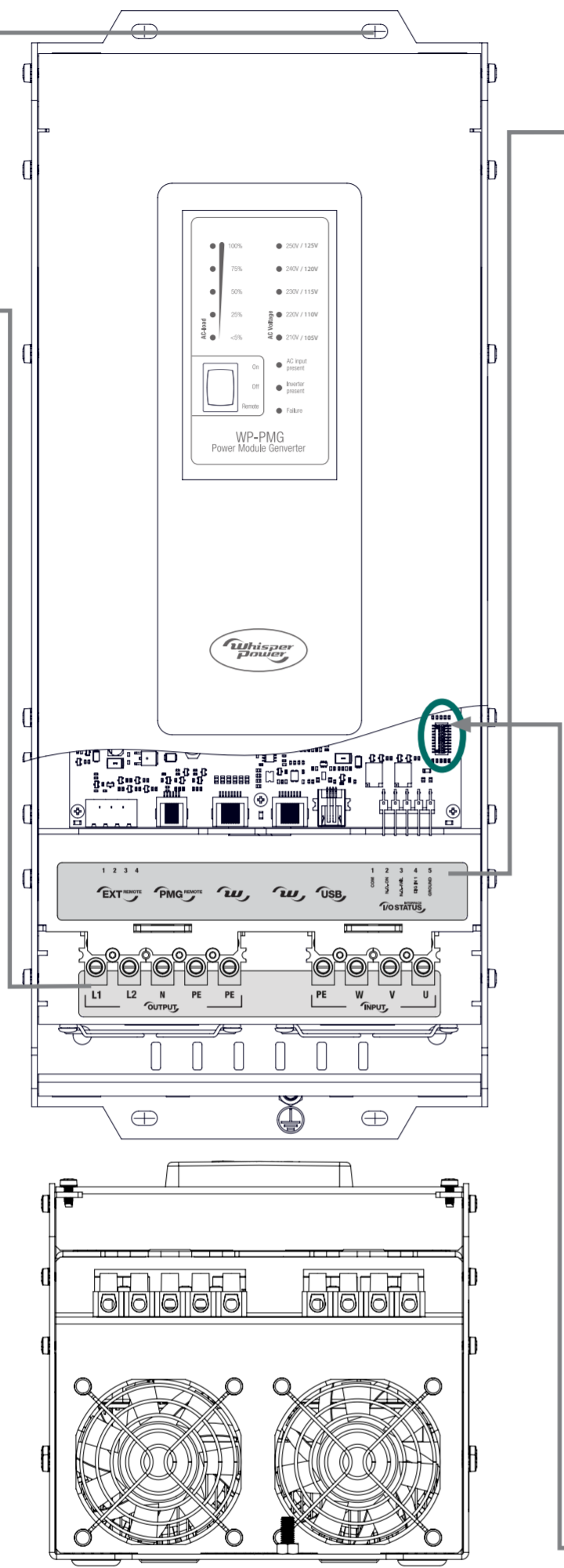
Replace the cover protecting the terminals and tighten the tapping screws.

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.



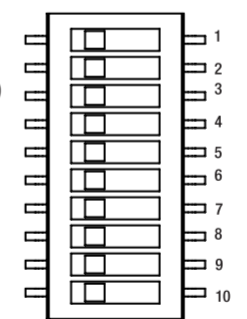
5. SPECIFICATIONS

Article nr.	POWER MODULE GENVERTER 10KW-230V	POWER MODULE GENVERTER 6KW-120V
	60201409	60201419
GENERAL SPECIFICATIONS		
Genverter model	GV 8, GV 10, GV 12	GV 8
Output load	True sine	True sine
Output voltage	200 .. 240 VAC (nominal 230V)	105 .. 125 VAC (nominal 120V)
Output voltage stability	+/- 5% (resistive load step 0 .. 100%)	+/- 5% (resistive load step 0 .. 100%)
Output frequency	45 .. 55 Hz (nominal 50Hz)	55 .. 65 Hz (nominal 60Hz)
Frequency variations	< 1%	< 1%
Output current	44A	53A
Nominal power	10kVA ¹⁾	6kVA ¹⁾
Continuous power (cos phi = 1)	10kW ¹⁾	6kW
Peak load (2 sec.)	16kW ²⁾	8kW
Nominal efficiency (@ full load)	95%	95%
Peak efficiency	97%	97%
Input voltage	3 times 260 .. 400VAC	3 times 260 .. 400VAC
Input frequency	200 .. 400Hz	200 .. 400Hz
Max. input current	26A	22A
Weight	9.9kg	9.9kg
Dimensions (h x w x d)	490 x 198 x 188mm	490 x 198 x 188mm
Mounting rectangle (h x w)	472 x 100mm	472 x 100mm
TECHNICAL SPECIFICATIONS		
Voltage THD (Total Harmonic Distortion)	< 5%	< 5%
Short circuit protection	yes	yes
Mean time between failure	10 years	10 years
Lifetime expectancy (@ 40°C and nominal load)	100,000 hours	100,000 hours
Local read out module	Inverter status load bar, voltage indicator	Inverter status load bar, voltage indicator
Remote panel (LED)	Inverter status load bar, voltage indicator	Inverter status load bar, voltage indicator
USB	For software parameter configuration	For software parameter configuration
Potential-free status contact	Inverter enabled / disabled	Inverter enabled / disabled
Recommended cable cross input / protection fuse	4mm ² / 32A	4mm ² / 32A
Recommended cable cross output / protection fuse	10mm ² / 63A RCD	16mm ² / 63A RCD
Remote panel connection	RJ12 twisted cable	RJ12 twisted cable
Engine interface connection	Engine RPM request (pwm signal)	Engine RPM request (pwm signal)
CONDITIONS		
Operating temperature	-20 .. 70°C (linear derating above 40°C)	-20 .. 70°C (linear derating above 40°C)
Storage temperature	-40 .. 80°C	-40 .. 80°C
Relative humidity in operation/storage	Max. 95% non-condensing	Max. 95% non-condensing
Protection degree	IP23	IP23
Ventilation	Forced cooling (temperature and load dependent)	
COMPLIANCE		
Directives: EMC 2004/108/EC, LVD 2006/95/EC		
Standards: EN 55022 (emission), EN 61000-3-2 (harmonics) EN 61000-3-3 (voltage fluctuations), EN 61000-6-1 (immunity), EN 60950-1, EN 60335-1, EN 60335-2-29 (safety), EN 68-2-6 (vibration), UL 458 (power converters / inverters)		

¹⁾ M-GV8 - 2 cylinder version will supply 8kVA / 6kW power.
²⁾ M-GV8 - 2 cylinder version will supply a peak load of 12kW.

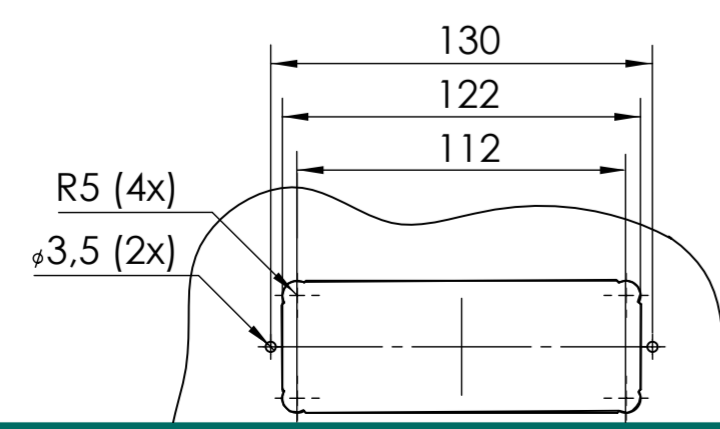
**230V model
DIP switches 1-10**

1. VAC OUT [volt] 240V
2. VAC OUT [volt] 220V
3. VAC OUT [volt] 310V
4. 60Hz (default OFF = 50 Hz)
5. PAC OUT 8kVA
6. PAC OUT 6kVA
7. Reduce Peak Current
8. Reserved
9. Reserved
10. Reserved

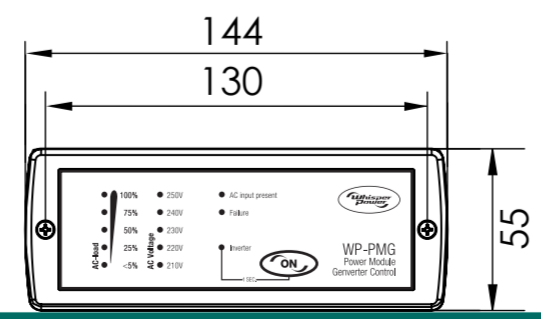


**120V model
DIP switches 1-10**

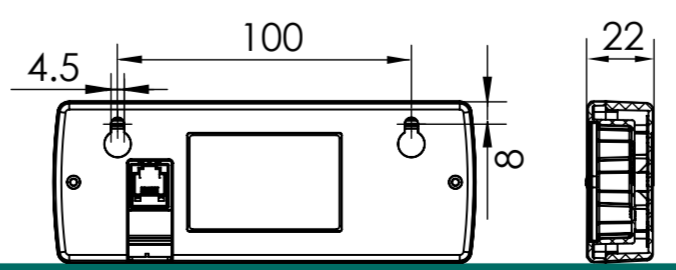
1. VAC OUT [volt] 130V
2. VAC OUT [volt] 115V
3. VAC OUT [volt] 110V
4. 60 Hz (default ON)
5. PAC OUT 5kVA
6. PAC OUT 4kVA
7. Reduce Peak Current
8. Reserved
9. Reserved
10. Reserved



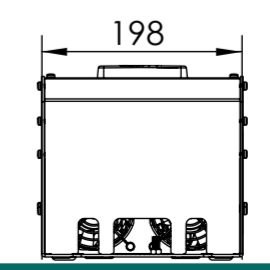
Mounting dimensions remote panel



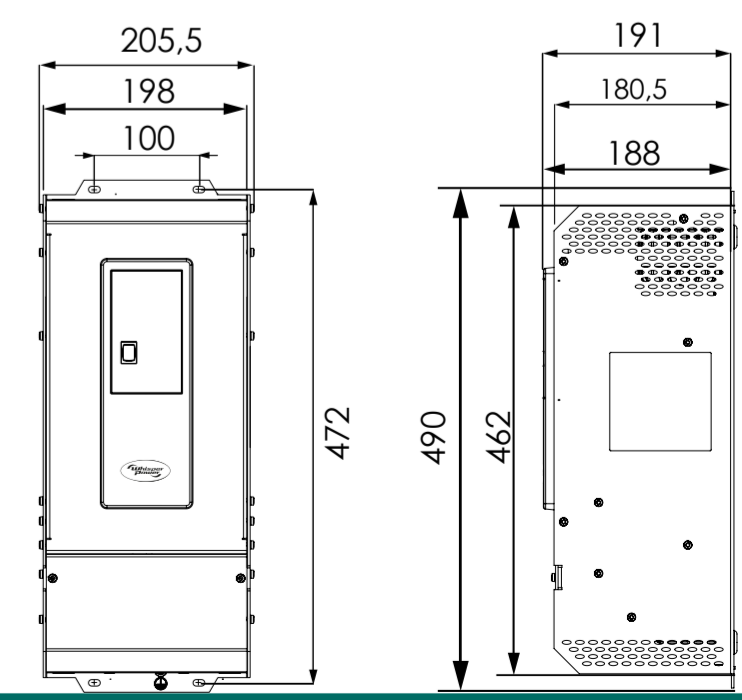
Front view remote panel



Rear and side view remote panel



Bottom view WP-PMG



Front and side view WP-PMG

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: 60201408 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 61000-6-1: 2007 (Electromagnetic compatibility [EMC] - Part 6-1: Generic standards - Immunity for residential commercial and light 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)

[Signature]
Drachten,
M. Favot, C.T.O. WhisperPower B.V.

