



USER MANUAL

WP-GI Compact

WhisperPower Galvanic Isolation-transformer



Protective hull isolation for boats

Galvanic safety isolation for vehicles



- Safety by galvanic isolation of AC power
- Prevention of galvanic corrosion
- Low noise, low weight toroidal transformer with vibration isolated mounting
- Soft starter integrated

1. GENERAL INSTRUCTION

Thank you for choosing our product. This manual contains important safety and operation instructions. Please read this manual before use. THE WP-GI NEEDS TO BE INSTALLED BY A SKILLED TECHNICIAN.

1.1 Safety instruction

As dangerous voltages and high temperatures exist within the WP-GI, only qualified and authorized maintenance personnel are permitted to open and repair it.

This manual contains information concerning the installation and operation of the WP-GI. All relevant parts of the manual should be read prior to commencing the installation. Please follow the local regulations. Any operation against the safety requirement or against design, manufacture and safety standard are out of the manufacturer warranty.

1.2 General precautions

- Do not expose the WP-GI to dust, rain, snow, liquids or gases of any type, it is designed for indoor use only in a well ventilated area.
- DO NOT block ventilation, otherwise the WP-GI may overheat.
- To avoid fire and electric shock make sure all cables have the correct thickness and are connected well.
- Please do not put any inflammable goods near to WP-GI.
- Never place the unit directly above batteries; gases from a battery will corrode and damage the WP-GI.

2. GENERAL DESCRIPTION

The WP-GI is a high efficiency galvanic isolation transformer with softstart function integrated. The softstart prevents tripping of circuit breakers when the transformer is magnetized at startup. It can be used as 230V to 230V transformer, 110V to 110V, 110V to 220V and 230V to 115V. In every situation, the full power can be taken from the output. The softstart adapts according to the chosen input voltage. **The frequency of the AC output voltage will be the same as the frequency of the input voltage.**

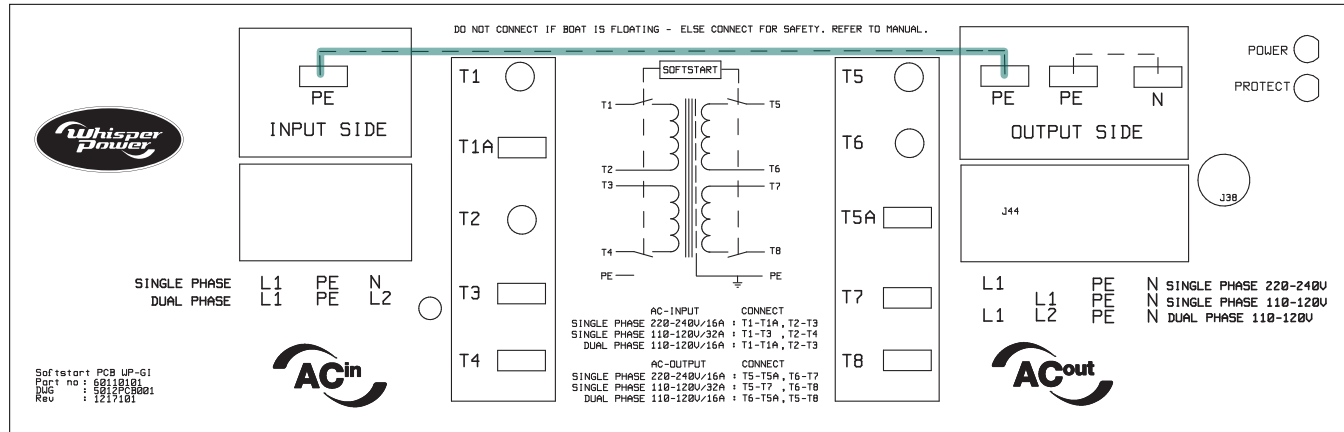
For protection, a residual current detector (ground fault circuit interrupter) with integrated circuit breaker should be installed up stream. An optional cover plate can be installed which can accommodate a standard DIN mounted device (see installation section).

2.1 Safety device

The AC output (secondary) connection is electrically isolated from the AC input (primary) connection and floating with respect to earth potential. Note that the Neutral on secondary side can be connected to the PE on secondary side which polarizes the signal AC out. Never touch the connections within when the unit is live.

2.2 Corrosion prevention for boats and ships

The device is mainly designed to be used as a galvanic isolation transformer to break the ground loop which causes galvanic corrosion on metal hulls on boats and ships. The primary protective earth (PE) connection is terminated in the isolation transformer without making any electrical connection. The PE of the secondary side is connected to a shield inside the transformed and the metal cabinet of the WP-GI. This secondary PE connection is connected to the grounding system of the ship forming a safe situation on board without the grounding loop to shore which causes the galvanic corrosion. A special connection can be made when the boat is on dry dock, connecting the primary PE to the secondary PE temporarily. →



2.3 Protections

The equipment is being protected against basic failures through hardware protection circuitry making it a robust and reliable equipment.

Overheat protection

In case a too high transformer temperature is detected, the WP-GI will switch off the output and the "PROTECT" led inside the connection compartment will be lit.

WARNING: After cooling down, the WP-GI will automatically reconnect the AC output.

High voltage protection

In case 230V is applied while the 110V setting is selected, fuses F1 will be blown which disables the softstart function. The unit will not switch on.

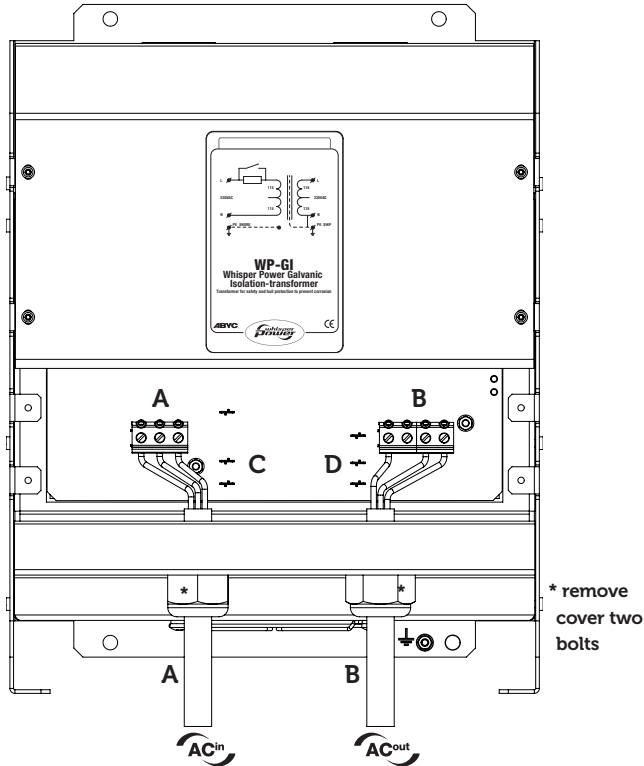
WARNING: Fuses F1 are inside the unit. Replacement of the fuses must be done by a skilled technician only.

If the correct voltage is selected and connected when the fuses F1 are blown, the transformer will magnetize immediately. Usually this will result in tripping of the circuit breaker installed at the grid input side upstream. The fuses F1 should be replaced.

2.4 Before installation

- Before installation choose:
- Input voltage
 - Output voltage
 - Connect secondary PE to secondary N according to regulations.

2.5 Installation



- A AC input cable 230V / 110V, 2.5mm² or 6mm²
B AC output cable 230V / 110V, 2.5mm² or 6mm²
C Select AC input voltage
D Select AC output voltage

WARNING: AC 230V is lethal! Double check that no voltage is present on the AC input cable before installing the cables or opening the cover.

Material list

- The unit is packed with following materials. Please confirm the series number on the unit is the same as on the outer carton
- WP-GI
 - User manual
 - Cable jumper to connect N to secondary PE
 - Cable jumper to connect primary PE to secondary PE

Location

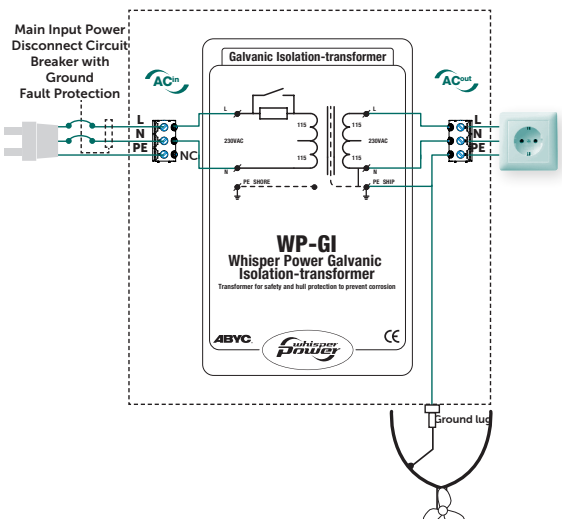
Please install the WP-GI in a dry, clean and good ventilated location. Working temperature: -10° C to +45° C, derating to 80° C Storage temperature: -25° C to +85° C Relative Humidity: 0 to 95%, non-condensing Cooling: Forced air, temperature controlled.

General advice

Before connecting the equipment, verify the AC input voltage and required output voltage according to the installation.

WARNING: Do not connect the output of this equipment to your AC system in parallel with any other AC source.

It is recommended to install an appropriate Ground Fault Circuit Interrupter (Residual Current Device) and Circuit Breaker at the AC input side (upstream). On the AC output side, a circuit breaker is recommended before each branch. It is not necessary to install a circuit breaker directly at the output of the WP-GI when appropriate cables have been used at input and output side.



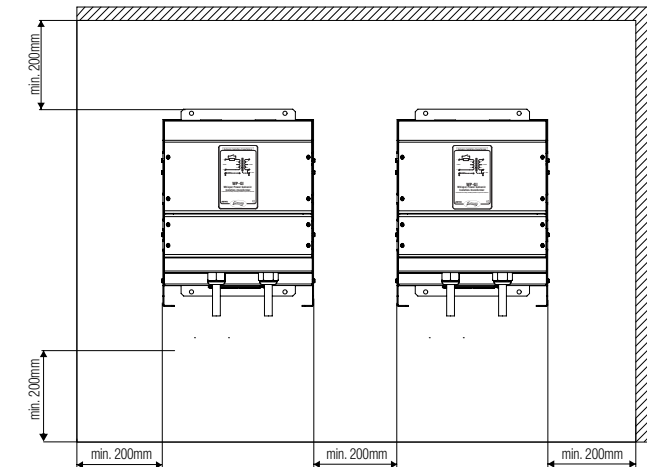
WARNING: Recommendations in this manual are just an advice. Always follow local regulations! The installer is responsible for correct installation of the device!

INSTALLATION AND CONNECTION

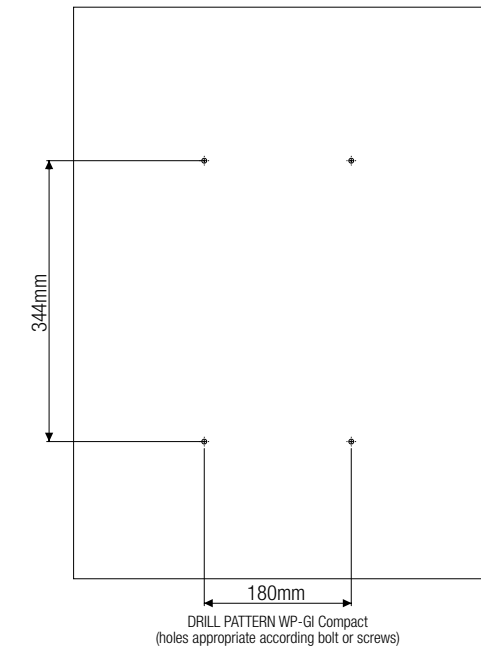
WARNING: For the safety of the installer, cut off all power before installation

Mount the WP-GI

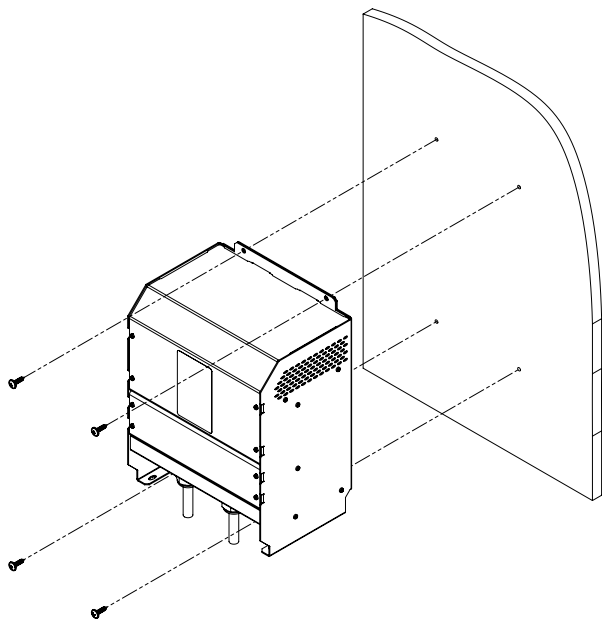
The WP-GI must be mounted vertically. Keep the vibration as small as possible. Keep proper ventilation space around the unit: 200mm to the wall, floor and other equipment.



The WP-GI can be mounted by a suitable central bolt or stud and bolts or studs at the bottom. See drill pattern:



Only mount on a solid (concrete or metal) wall. The unit weights 28.6 kg. Schematic overview:



CONNECTING THE WP-GI

Wiring recommendation

Please find the following minimum wire size.

Voltage/Current	AC wiring
230V / 16A	2.5mm ²
110V / 32A	6mm ²

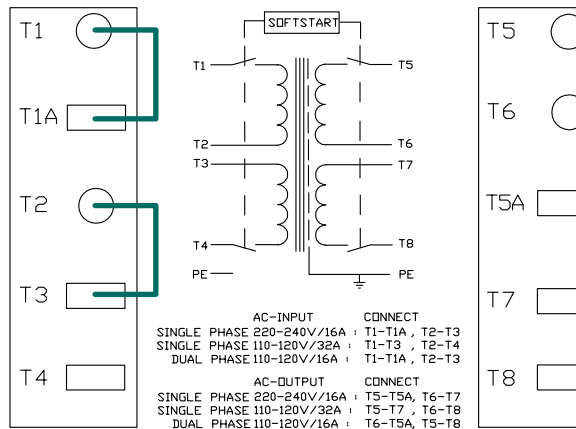
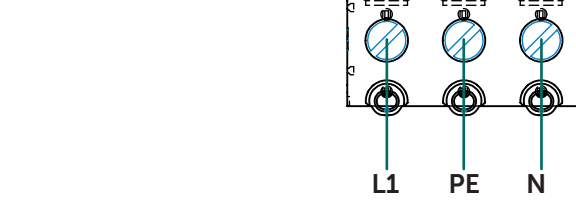
Connecting the AC cable

AC input cable: Pull the AC input cable through the gland and connect it to the AC input connector. Connections are marked as "L"-line, "N"-neutral (or "L2"-line) and "PE"-earth. Make sure it is tightly screwed. Choose the proper input terminals according to the table found on the connector PCB inside the connection compartment.

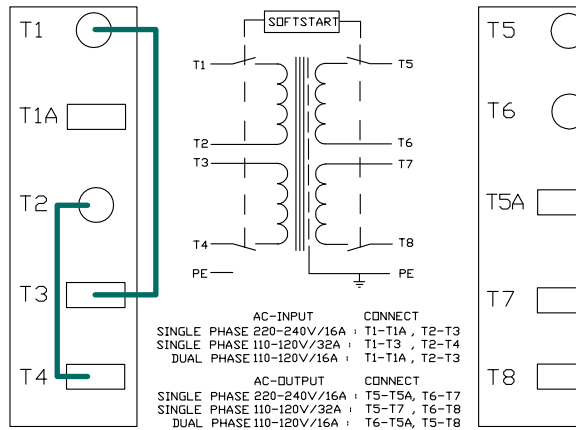
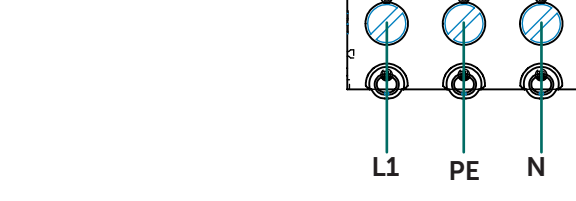
Choosing the input voltage:

The input and output voltage can be selected independent from each other. It is done in the following section in the connection compartment.

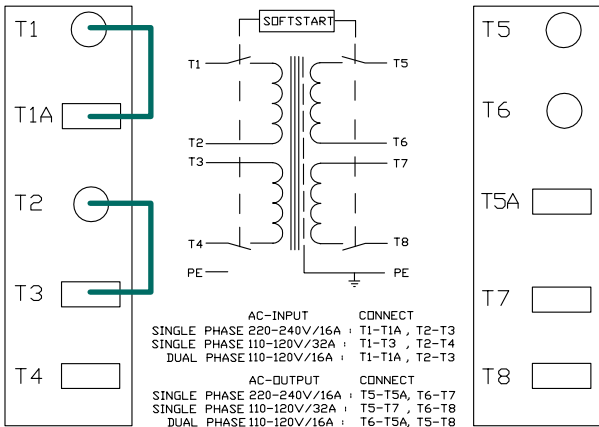
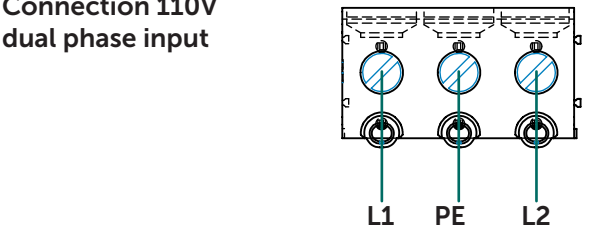
Connection 230V input



Connection 110V single phase input



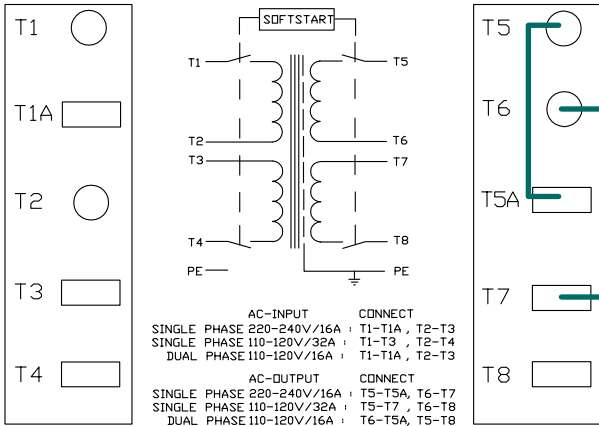
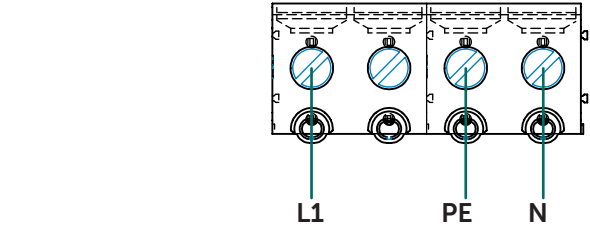
Connection 110V dual phase input



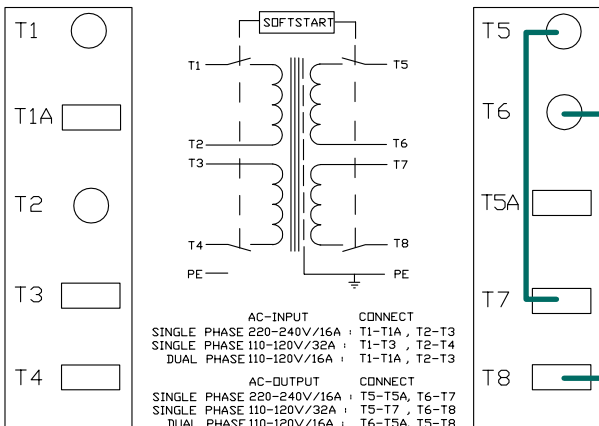
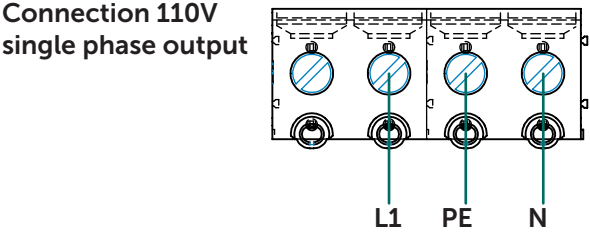
Note that if dual phase 110V is connected to the input, the Neutral is not connected.

AC output cable:
Pull the AC output cable through the cable gland and connect it to the AC output connector. Connections are marked as "L1"-line, "L2"-line, "N"-neutral and "PE"-earth. Make sure it is tightly screwed. Choose the proper output terminals according to the table found on the connector PCB inside the connection compartment.

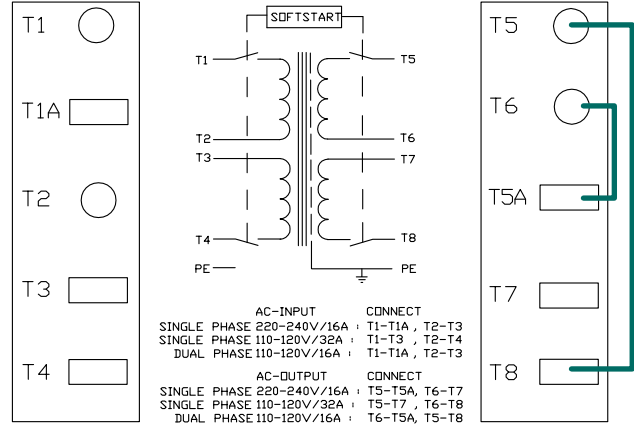
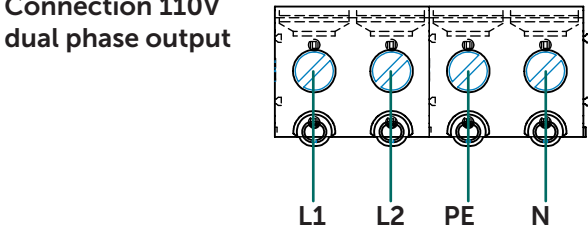
Connection 230V output



Connection 110V single phase output



Connection 110V dual phase output



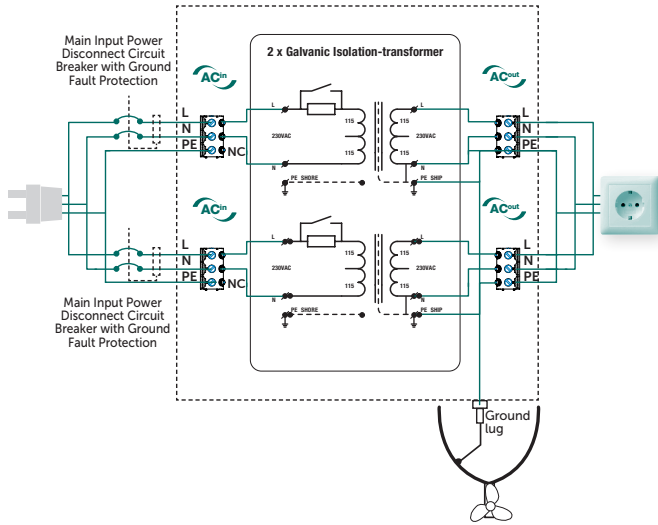
WARNING: Check the AC input and AC output after connection. Wrong or loose connections will damage the WP-GI permanently.

Protective earth
Depending on local regulations and usage of the safety isolation transformer, connect the output PE to output N using the wire jumper 2.5mm² to polarize the system. This can be done on the location above the AC output connector.

If the secondary PE may not float (e.g. when the boat is in dry-dock or on a land based vehicle), the INPUT side PE can be connected to the OUTPUT side PE using the 2.5mm² wire jumper. In the standard configuration, the shielding of the transformer is connected to the secondary AC side (output) of the WP-GI and the casing. Upon request, the shielding can be connected to the primary AC (input) side without connection to the casing. This is not standard and requires opening of the casing.

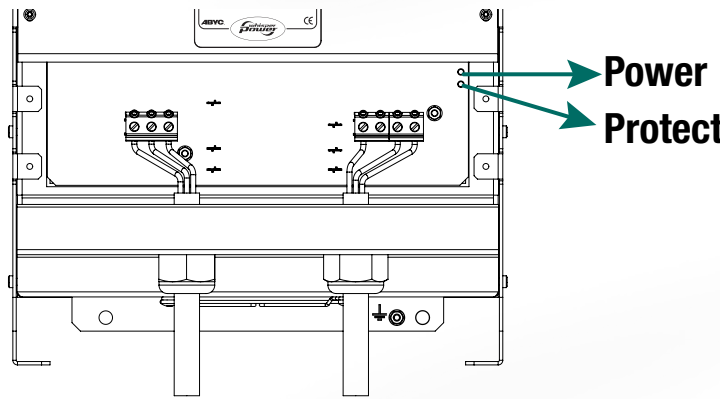
- Parallel running of 2 units**
When a high power grid/shore connection is available, it is possible to run two WP-GI units in parallel to create a power group with 230V/32A output or 110V/64A. This is a special application and requires the following steps:
1. The units should be ordered as parallel set (see 'specification' paragraph) to ensure the units do equal load sharing (verified at factory). Check that the first 5 characters of the serial numbers of both units are identical.
 2. Both units must be connected to the same grid input.
 3. Use equal length cables for both input and output connections for optimal load sharing.
 4. A circuit breaker of half the total rating (230V/16A or 110V/32A) must be put before the input of **each unit** separately!
 5. The outputs of both units can be connected in parallel and fed to the AC distribution.

Verify installation by putting on a load and verify the load sharing with AC current clamp. The AC current of unit 1 should be equal to the current measured at unit 2. A difference of 2A is allowed at full load but is generally less.



2.6 Operation
The WP-GI has no buttons to operate. When the AC input voltage is connected to grid or shore power, the softstart will energize the transformer. The POWER and PROTECT LED will light up and then the AC output is switched on. The red PROTECT LED will switch off and the green POWER LED will remain lit.

The green POWER LED will remain on as long as there is AC input power. If any failure is detected during operation, the output will be switched off and the red PROTECT LED will be lit.



2.7 Trouble Shooting

Problem	Possible cause	Solution
No output voltage	No input voltage	Check all input connections and breakers upstream
	Wrong input voltage	Check voltage and settings
The PROTECT LED burns	Over temperature	Check ambient temperature Check if ventilation is blocked
	Wrong input voltage	Check that continuous load is <3600W Check if fans are working
		Check input voltage and settings
When AC input is connected, the input circuit breaker trips	Load on output too high	Check current rating of circuit breaker on input and adapt load accordingly.
	Softstart does not work	Fuses F1A are blown. Repair by skilled technician (requires opening of the casing)
AC Connector sparks or has blackened	Wire ends in terminals not properly tightened	Replace wiring, verify connector, tighten correctly
I have 230V/60Hz at the output instead of 230V/50Hz.	110V/60Hz on the input.	Change input. The WP-GI is a high efficiency 1:1 transformer with multiple connection taps. The frequency cannot be converted as there are no power conversions done by the unit.

2.8 CE declaration of conformity

We,
Whisper Power B.V.
Kelvinlaan 82, 9207 JB Drachten
The Netherlands

hereby declare that:

Product: 60110102 WP-GI Galvanic Isolation-transformer Compact

Product type: Galvanic Isolation-transformer Compact

Is in conformity with the following provisions of the EC 2004/108/EC (EMC directive) and the 2006/95/EC (Safety directive).

The following standards have been applied:
- Generic emission standard: EN61000-6-3:2007
- Generic immunity standard: EN61000-6-1:2007
- Low voltage standard: EN60950-1:2006

Drachten,

R.ter Heide
C.E.O. Whisper Power B.V.



2.9 Specification

Article nr. 60110102	WP-GI 3600 Galvanic Isolation-Transformer Compact	
Application	Galvanic Isolation-transformer Compact for safety and protection of galvanic corrosion	
Transformer type	2 winding toroidal isolation transformer	
Construction method	Special vibration isolated mounting of transformer	
Cooling method	Temperature controlled gradually regulated forced air cooling above 60° transformer core	
Winding Data	WP-GI 3600	WP-GI 7000
Rated power	3.6kVA	7.0kVA
Rated voltage	230V / 110V	230V / 110V
Rated frequency	50Hz / 60Hz	50Hz / 60Hz
Nominal current	16A / 32A	30A / 60A
Inrush current	Softstart included <4A per unit	
Tappings	Prim/sec. mid-point (110VAC)	
Material winding	Copper	
Temperature rise class	Class F 100 K	
Insulation class	Class H 180 C	
Insulation level	Class AC3	
Impedance	Secondary less than 3.0% at 3.6kVA	
General		
No load consumption	21W per unit	
Full load efficiency	>95%	
Ambient operating temperature	-10°C .. +45°C, derating to 80°C	
Storage temperature	-25°C to 85°C	
Operating humidity	95% max, non-condensing	
Audible noise	<40.0 dB(A); <50dB(A) with forced cooling	
Local user interface	None	
Protections		
Overcurrent, short circuit	Not included, external breaker(s) required according to local regulations	
Temperature protection	Automatic switch off if transformer core > 120°C	
Overvoltage protection	Softstart is protected for overvoltage using fuse	
Earthscreens between windings	Compliant to ABYC, can carry full fault current	
Safety	Standards IEC 60079, IEC 60726	
Mechanical		
Protection degree	IP21	
Connections input/output	6mm² max.	
Cable gland entry	22mm	
Dimensions (HxWxD)	380x290x208 per unit	
Mounting holes	M8	
Weight	28.6 kg per unit	
Enclosure construction	Aluminum sheet metal	
Surface finishing	RAL9010 white+AE80104123621 black	

