



# Isolation transformers

## Isolation transformers

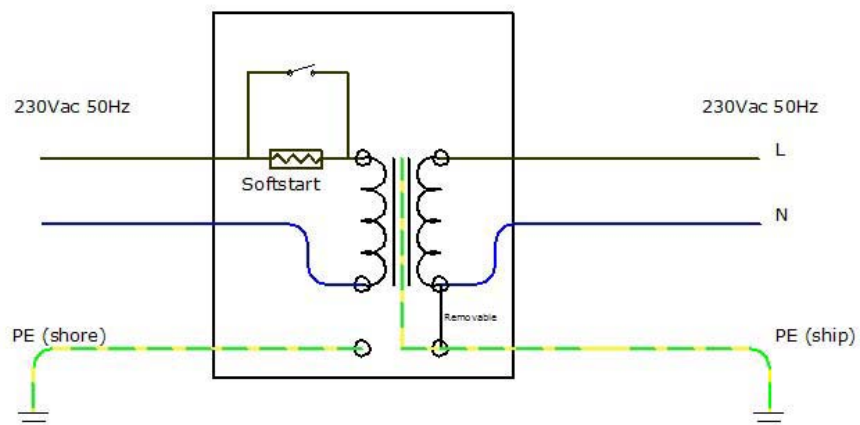
The isolation transformer eliminates any electrical continuity between AC shore power and the boat. It is essential for safety and eliminates the need for galvanic isolators and polarity alarms

**Safety** is taken for granted in case of a normal on-shore installation. A fuse will blow or a GFCI (Ground Fault Current Interrupter) will trip in case of a short circuit or current leakage to ground. Connecting the ground wire of the shore-side supply to the metal parts of the boat will result in galvanic corrosion (see below). Bringing only the live and neutral wire on board results in an unsafe situation because GFCI's will not work nor will a fuse blow in case of a short circuit to a metal part on the boat.

**Galvanic corrosion** occurs when two dissimilar metals in electrical contact are simultaneously exposed to an electrically conducting fluid. Seawater and, to a lesser extent, fresh water are such fluids. In general, the more active alloy of the couple corrodes preferentially while the less active (more noble) material is cathodically protected. The rate of galvanic corrosion is a function of several variables including area ratios, conductivity of the fluid, temperature, nature of the materials, etc.

**It is a misunderstanding** that galvanic corrosion occurs only in metal and aluminium hulls. In fact it can occur on any boat as soon as a metallic part (the shaft and propeller) is in contact with water. Galvanic corrosion will quickly dissolve your sacrificial anodes, and attack the shaft, propeller and other metal parts in contact with water as soon as the boat is connected to the shore-side supply. It might therefore be tempting not to connect the ground conductor: this is however extremely dangerous because GFCI's will not work nor will a fuse blow in case of a short circuit to a metal part on the boat.

**The best solution** to avoid galvanic corrosion and at the same time prevent any unsafe situation is to install an isolation transformer to connect to the shore-side supply.



The isolation transformer eliminates any electrical continuity between shore power and the boat. The shore power is fed to the primary side of the transformer and the ship is connected to the secondary. The isolation transformer completely isolates the boat from the shore ground. By connecting all metal parts to the neutral output on the secondary side of the transformer, a GFCI will trip or a fuse will blow in case of a short circuit.

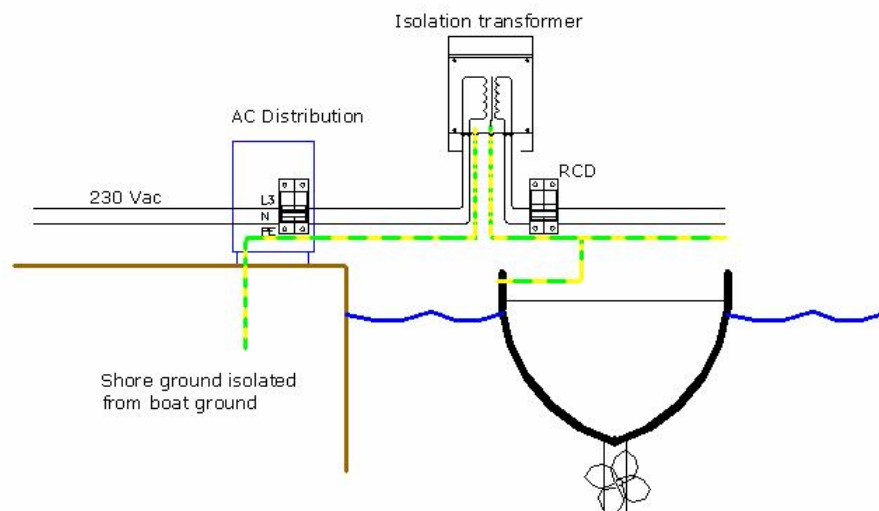
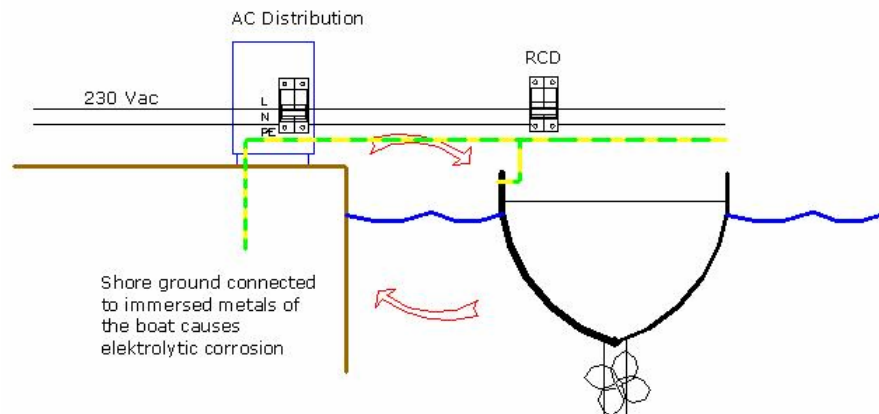
**Soft start** is a standard feature of a Snaptec isolation transformer. It will prevent the shore power fuse from blowing due to the inrush current of the transformer, which would otherwise occur.

**It is also recommended**, for optimal safety, to connect the secondary neutral of the transformer to ground when the boat is out of the water

# Isolation transformers

Isolation transformers	1800 Watt...1)	3600 Watt	3600 Watt...1)	7000 Watt
Input and output voltage	115 / 230V	230 V	115 / 230V	230 V
Frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Rating	16 / 8 A	16 A	32 / 16 A	30 A
Soft start	Yes			
Transformer type	Toroidal (low noise, low weight)			
Enclosure	Aluminium			
Input circuit breaker	yes			
Protection category	IP21			
Safety	EN 60076			
Weight	10 Kg	23 Kg	23 Kg	24 Kg
Dimensions (h x w x d), mm	375x214x110	362 x 258 x 218		

1) Can be used as:  
 115 V to 115 V isolation transformer                      230 V to 230 V isolation transformer  
 115 V to 230 V isolation transformer                      230 V to 115 V isolation transformer



**USER MANUAL  
INSTALLATION MANUAL**



**Isolation transformers**

**ITR040182040**

**Isolation Transformer 1800W 115/230V 16/8A**

**ITR040362040**

**Isolation Transformer 3600W 115/230V 32/16A**

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## 1. Important safety instructions



Warning!

Before installing or using this product, please read and save the safety instructions below.

### 1.1. General safety precautions

- 1.1.1. Do not expose the isolation transformer to water, mist, snow, spray, or dust.
- 1.1.2. Do not use the product where there is a risk of gas or dust explosions. This product is not ignition protected.
- 1.1.3. Use the product in accordance with specifications as stated in paragraph 4.
- 1.1.4. Do not open the enclosure if the product is still connected to a source of electrical power.

### 1.2. Safety: Installation

- 1.2.1. Connections and safety features must be according to the locally applicable regulations.
- 1.2.2. This is a Safety Class 1 product (supplied with a protective grounding terminal). Uninterruptible protective grounding must be provided.
- 1.2.3. Use electric cables of the appropriate size.
- 1.2.4. Install the isolation transformer in a well ventilated area.
- 1.2.5. Keep a clear space of 10 cm around the product for ventilation.
- 1.2.6. For safety purposes, the product should be installed in a heat-resistant environment. Avoid the presence of e.g. chemicals, synthetic components, curtains or other textiles in the immediate vicinity of the product.

## 2. Installation



Warning!  
Shock hazard. Do not work on the isolation transformer or the electrical system if still connected to an electrical power source.

### 2.1. Connection (see fig 1)

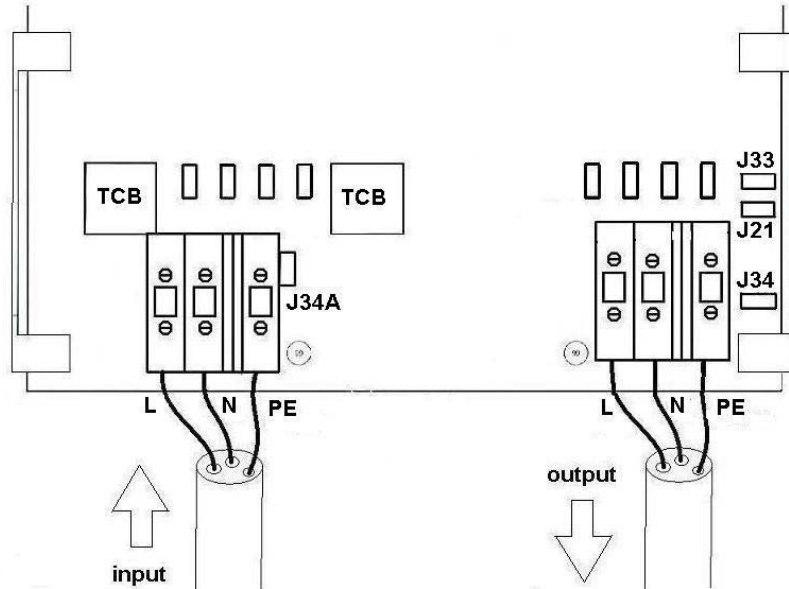


Figure 1: Input and output terminals

- 2.1.1. Pass the shore-side cable through the left side cable gland, at the bottom of the cabinet.  
Pass the AC-output cable through the right side cable gland.
- 2.1.2. Connect the shore cable to the terminals indicated with "INPUT".  
Connect the green/yellow wire to PE.  
Connect the brown wire to L and connect the blue wire to N.

- 2.1.3. Connect the load to the terminals indicated with "OUTPUT".  
 Connect the green/yellow wire to PE.  
 Connect the brown wire to L and connect the blue wire to N.
- 2.1.4. Connect the enclosure to ground (= all the metal parts in the boat). This is achieved by establishing a ground connection to the M4 stud on the bottom of the enclosure.
- 2.1.5. Use the following minimal cable cross sections:

1800W model:

115/120 V	2.5 mm <sup>2</sup>	AWG 13
230/240 V	1.5 mm <sup>2</sup>	AWG 16

3600W model:

115/120 V	6 mm <sup>2</sup>	AWG 10
230/240 V	2.5 mm <sup>2</sup>	AWG 13

## 2.2. Adjustment for the required input voltage and output voltage



Warning!  
Check the adjustments for input voltage and output voltage before operating the isolation transformer.

2.2.1. For 230/240 V input and/or output, connect the push-on jumpers as shown in fig 2.

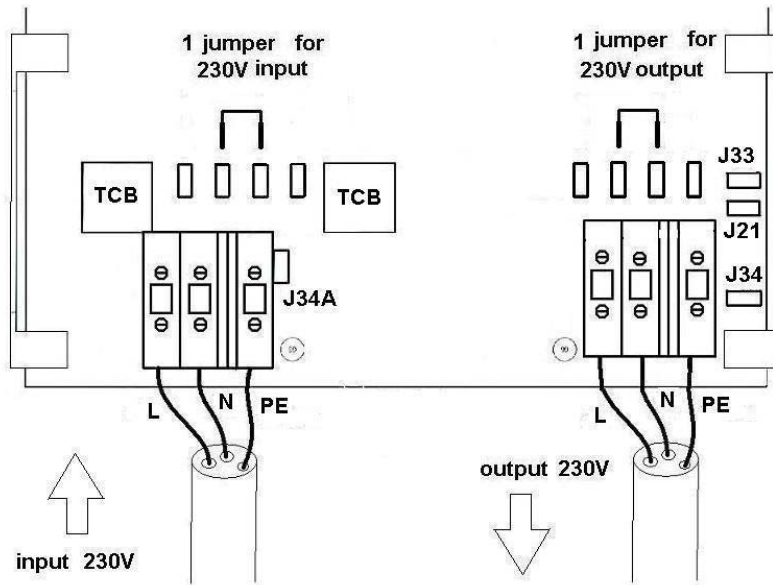


Figure 2: Jumper settings for 230/240 V input and/or output

2.2.2. For 110/120 V input and/or output, connect the push-on jumpers as shown in fig 3.

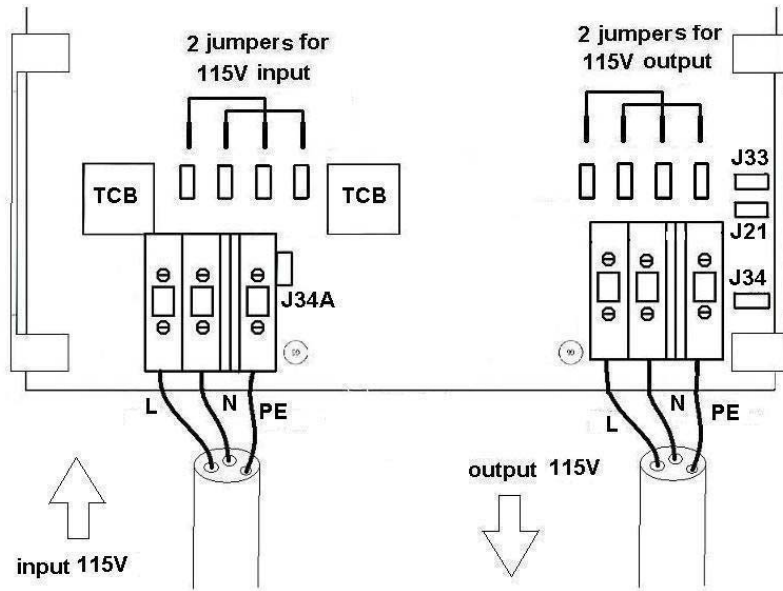


Figure 3: Jumper settings for 115/120 V input and/or output

### 2.3. Input earth connection (fig 4)

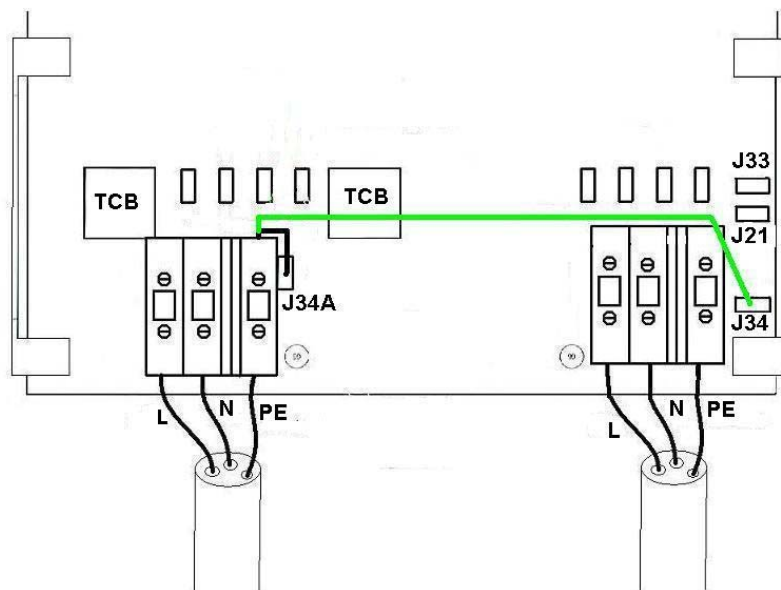


Figure 4: Input earth connection

- If the boat is floating, connect the PE wire coming from the input PE terminal to male push-on connector J34A (wire shown in black on fig 4). Now input and output are isolated from each other.
- If the boat is on shore (winter period or maintenance), the PE conductor in the boat must be connected directly to the input PE, for safety reasons. This is achieved by connecting the PE wire coming from the input PE terminal to male push-on connector J34 (wire shown in grey on fig 4).

## 2.4. Output neutral grounding (fig 5)

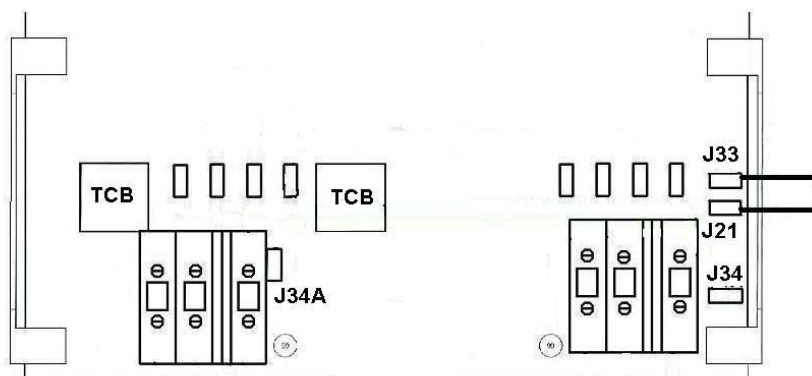


Figure 5: Output neutral grounding

A Residual Current Device (RCD) or Ground Fault Circuit Interrupter (GFCI) must be installed in the output cable of the isolation transformer. For this RCD to operate correctly, the output neutral must be connected to ground (= all the metal parts in the boat). This is achieved by placing a jumper on male push-on connectors J21, J33 (see fig 5), and by grounding the enclosure of the isolation transformer.

## 3. Operation

### 3.1. Thermal circuit breaker

The isolation transformer is fitted with an automatic circuit breaker. This circuit breaker will switch off the isolation transformer in case of overload or short-circuit.

### 3.2. Temperature protection

The isolation transformer is fan cooled. The fan rpm is temperature controlled.

The isolation transformer will switch off in case of overheating.

### 3.3. Inrush current limiter

The inrush current limiter prevents upstream circuit breakers or fuses from tripping when switching on the isolation transformer.

#### 4. Specifications

Isolation transformers	1800 Watt...(1)	3600 Watt...(1)
Input and output voltage	115 / 230V	115 / 230V
Frequency	50/60Hz	50/60Hz
Rating	16 / 8 A	32 / 16 A
Soft start	Yes	
Ambient temperature	-20°C to 40°C	
Humidity	Max 95%, non condensing	
Transformer type	Toroidal (low noise, low weight)	
Enclosure	Aluminium	
Input thermal circuit breaker	yes	
Protection category	IP21	
Safety	EN 60076	
Weight	10 Kg	23 Kg
Dimensions (h x w x d), mm	375x214x110	362x258x218

1) Can be used as:

115 V to 115 V isolation transformer

230 V to 230 V isolation transformer

115 V to 230 V isolation transformer

230 V to 115 V isolation transformer