ENGLISH



Victron Energy Autotransformer

50 A and 100 A

Rev 00 - 01/2026

This manual is also available in HTML5.

Table of Contents

1. Safety **1**

2. Introduction **2**

2.1. Description 2
2.2. Models 2
2.3. Types of Use 2
2.3.1. Balancing 2
2.3.2. Stepping Up Voltage 4
2.3.3. Stepping Down Voltage 5
2.4. Ground Relay 7
2.5. Temperature Protected 7
2.6. Over Current Protection 8
2.7. Sizing Limitations 8

3. Installation **9**

3.1. Installation Considerations 9
3.2. Mounting 9
3.3. Wiring 9
3.4. Conduit 9

4. Specifications **10**

5. Enclosure Dimensions **11**

6. Warranty **12**

1. Safety

- These instructions are for use by qualified personnel only. Do not perform any servicing or installation other than that specified in the operating instructions unless you are qualified to do so. Incorrect installation or servicing may result in a risk of electric shock, fire, or other safety hazards.
- All electrical work should be performed in accordance with local and national electrical codes.
- This product is designed for indoor/compartment installation.
- Use insulated tools to reduce the chance of electrical shock or accidental short circuits.
- Select the wire size based on the protection provided by the circuit breakers.
- Before making any connections verify that the circuit breakers are in the off position including the inverter breaker. Double check all wiring before applying power.

The following safety symbols have been placed throughout this manual to indicate dangerous and important safety instructions.



CAUTION: This symbol indicates that failure to take a specified action could result in damage to the equipment.



Info: This symbol indicates information that emphasizes or supplements important points of the main text.

2. Introduction

2.1. Description

The Victron Energy Autotransformer (AT) supports many different wiring configurations. It can increase your system's ability to adapt to different design and Voltage requirements, and also be used to balance loads in split-phase 120/240Vac systems. Specialty systems such as boats and vehicles may face different shore configurations while traveling, an autotransformer can help by being flexible and enabling connections to most grid configurations.

The Victron Energy Autotransformer has the ability to use a ground/earth relay to create a Neutral to Ground bond in the AT itself, if coupled with a Victron Energy MultiPlus or Quattro and the relay terminals are interconnected.

This manual will explain the many uses for this device and how to safely install and wire it. Below there are general examples of four ways the Autotransformer can be applied. There are several specific uses that can be realized in the integration of an autotransformer into an installation and are explained in section 2.4. The AT does not provide isolation. See section 4 for specifications.

2.2. Models

- 120/240V - 50A
- 120/240V - 100A

Pass through current is 50A and 100A respectively, the transformers are 100% equal in both models. See more information in section 2.7.

2.3. Types of Use

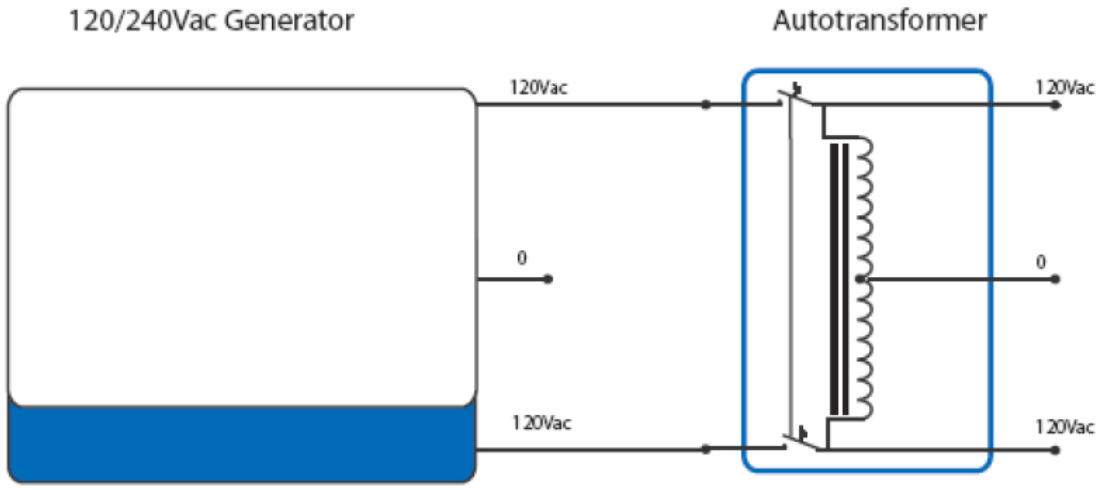
2.3.1. Balancing

Balancing a Generator or Stacked Inverters

Full power from a split phase supply source such as a generator or stacked inverters is sometimes limited, as a single phase load cannot draw more energy than its individual leg will allow even though the other leg isn't fully utilized.

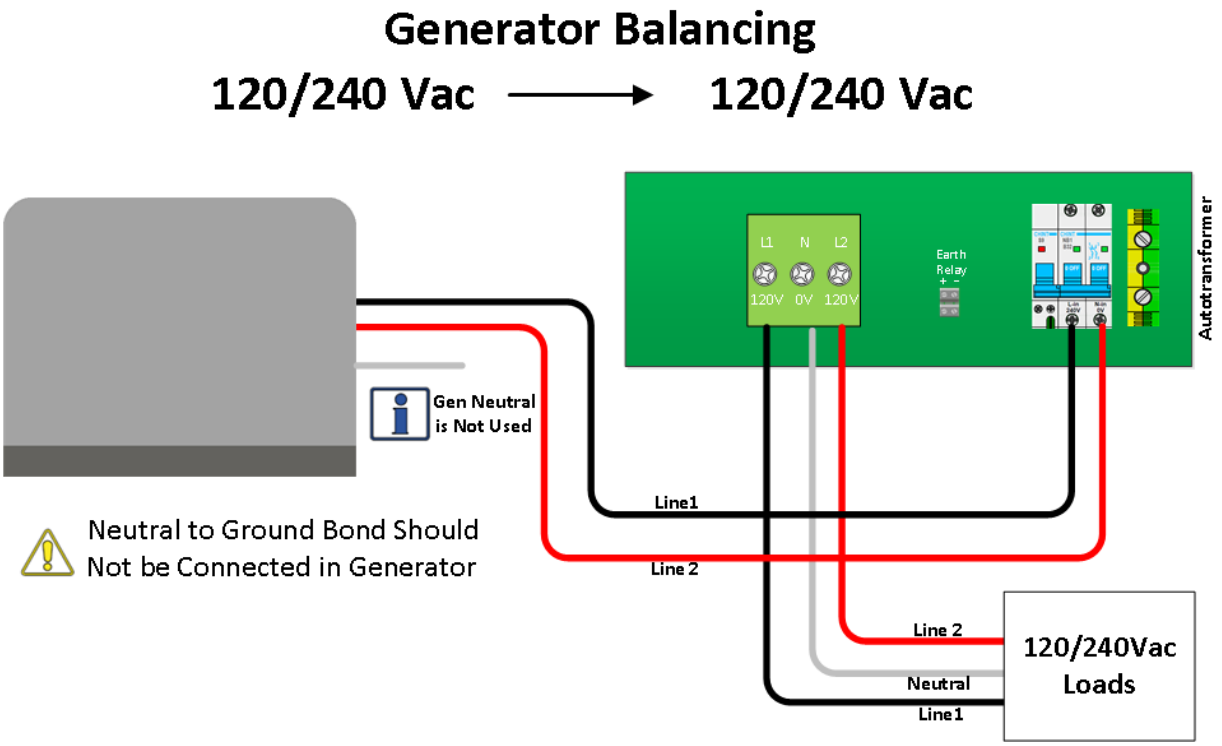
If balancing a generator or stacked inverters is required, the AT can accomplish this by leaving the neutral of the split phase supply unused, to create a new neutral, as shown in the illustration below. Any load unbalance is "absorbed" by the autotransformer.

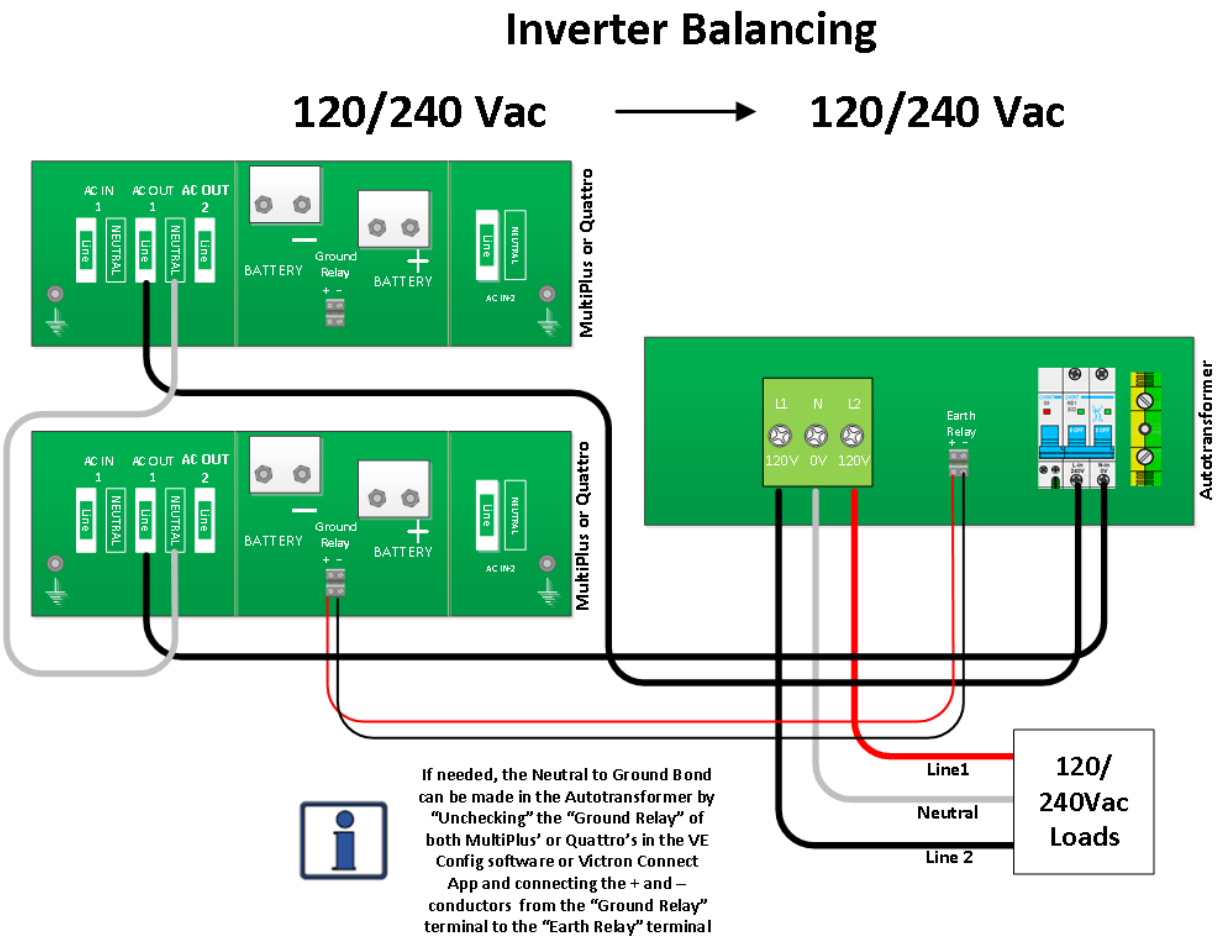
The two legs of a split phase from an AT are independent from each other, beside the fact there is a fixed phase shift between them. This (180Deg) phase shift means the sine-wave of both legs is in full opposite (creating a double voltage from leg to leg rather than that of leg to Neutral).



With an AT, energy from one leg can be "transferred" to the other leg which creates a far higher total load level, unlocking the full potential of power available from a generator or stacked inverters..

See diagram below for wiring instructions.





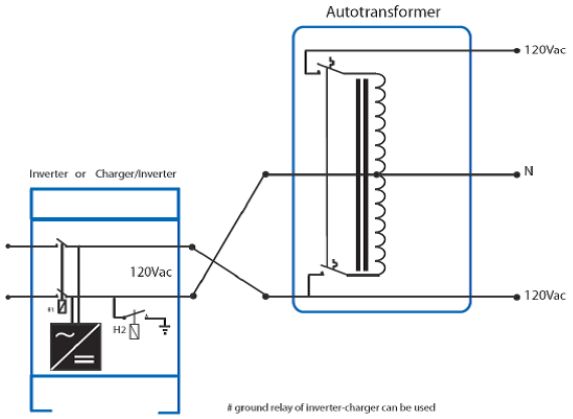
2.3.2. Stepping Up Voltage

Alternative to Stacked Inverters.

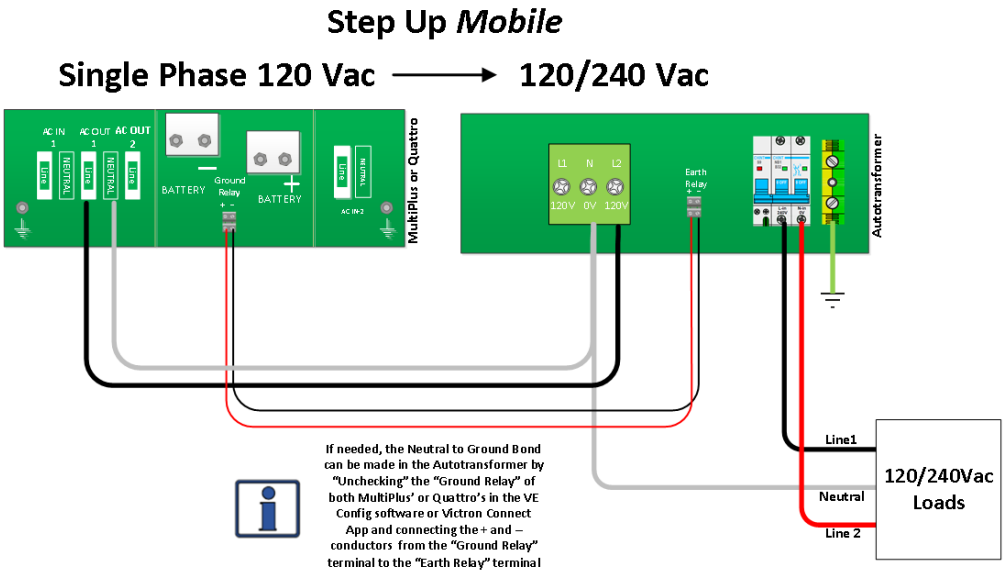
Loads such as deep well water pumps and air conditioning units sometimes require Split-Phase 120/240Vac power.

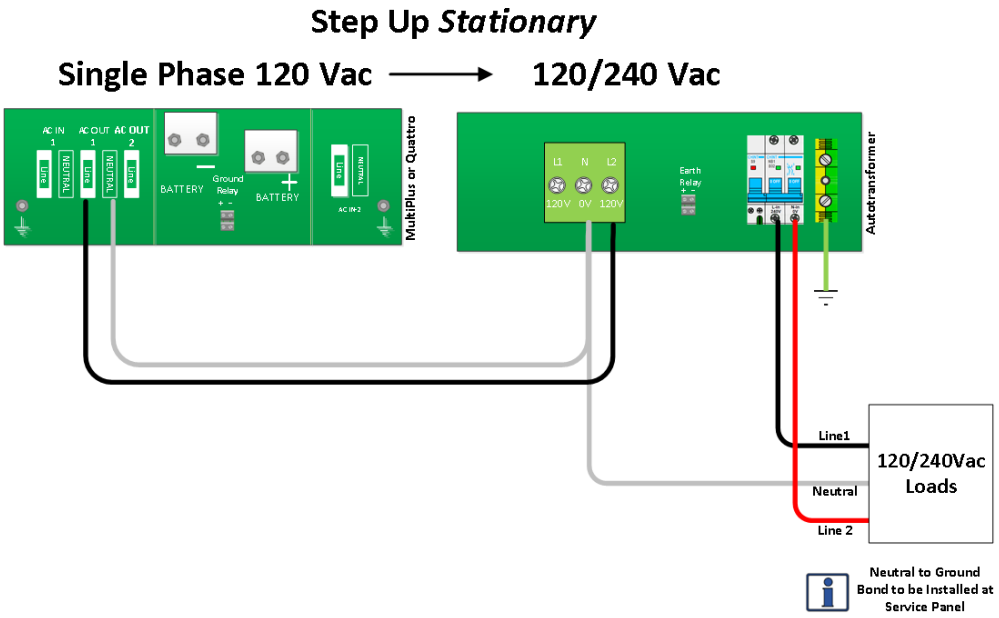
When the available AC power source is not what is needed in the installation, the autotransformer can create the needed voltage by doubling the incoming voltage.

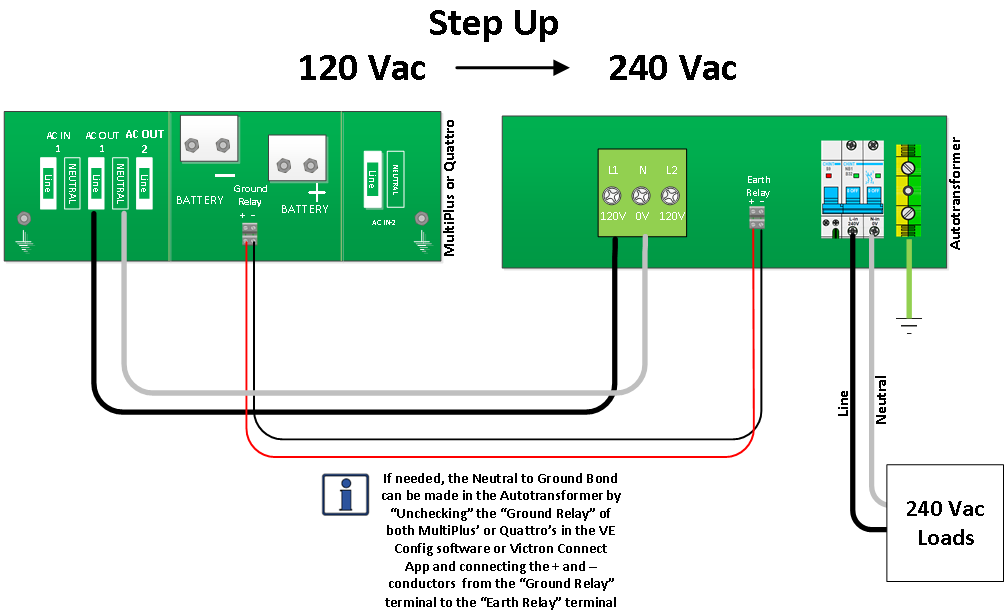
The alternative to stacking two 120Vac inverters to provide a 120/240Vac Split-Phase is a single 120Vac inverter with an additional autotransformer.



Other possible cases for stepping up the Voltage are shown in the wiring diagrams below.







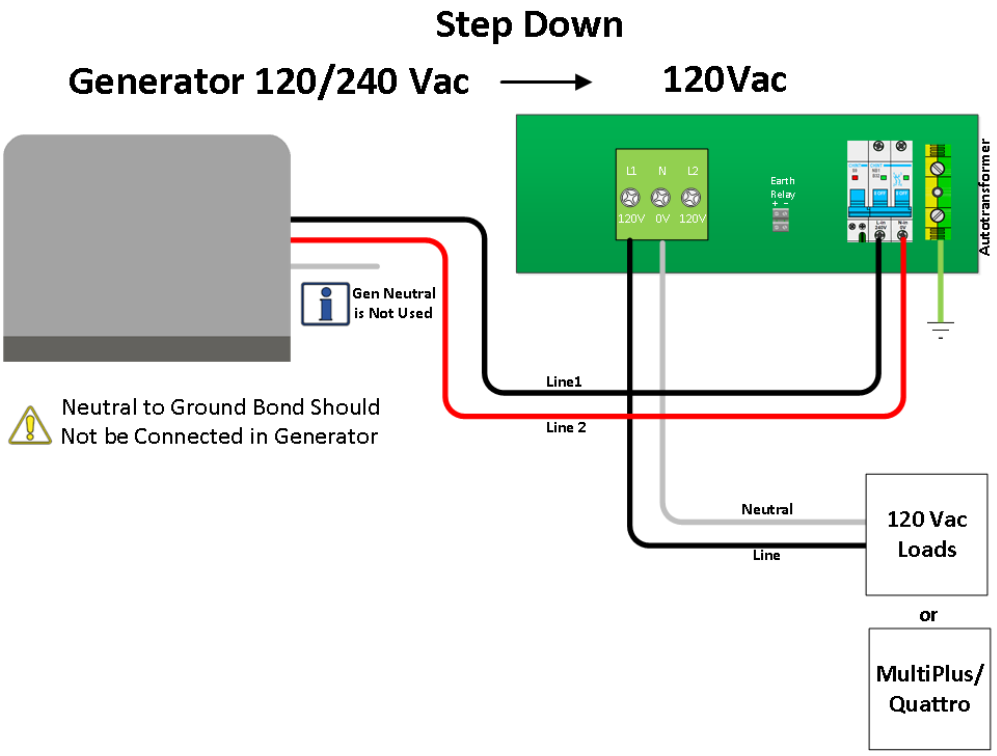
2.3.3. Stepping Down Voltage

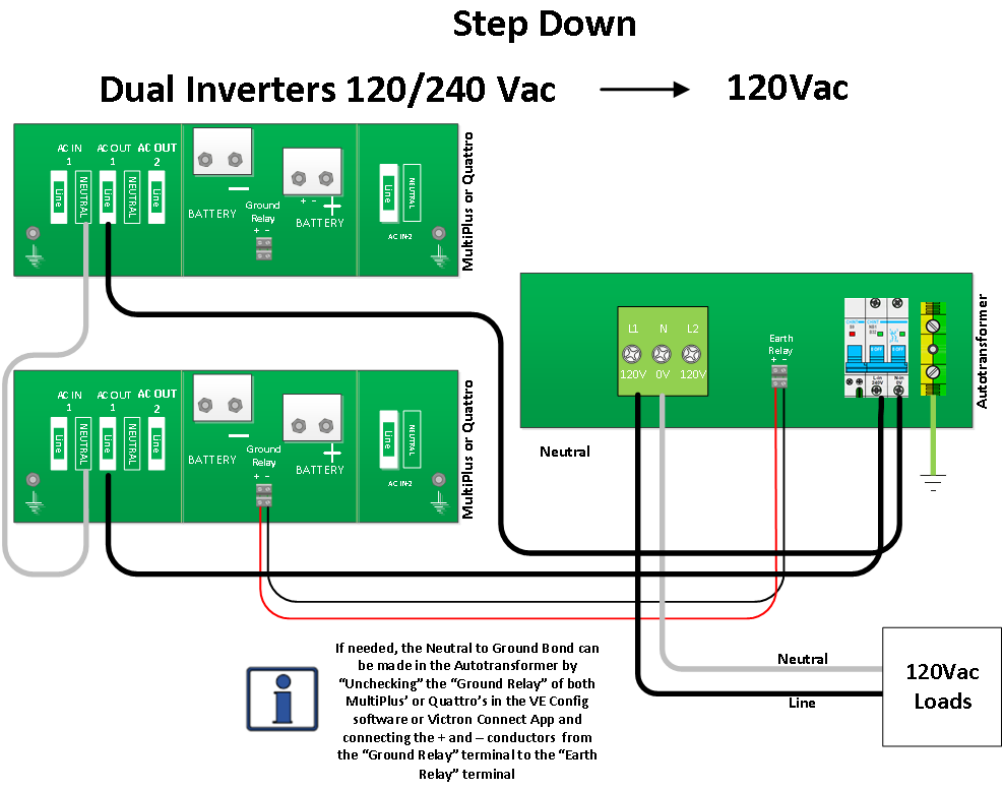
Flexibility in Using Split-Phase for Single-Phase Inverters

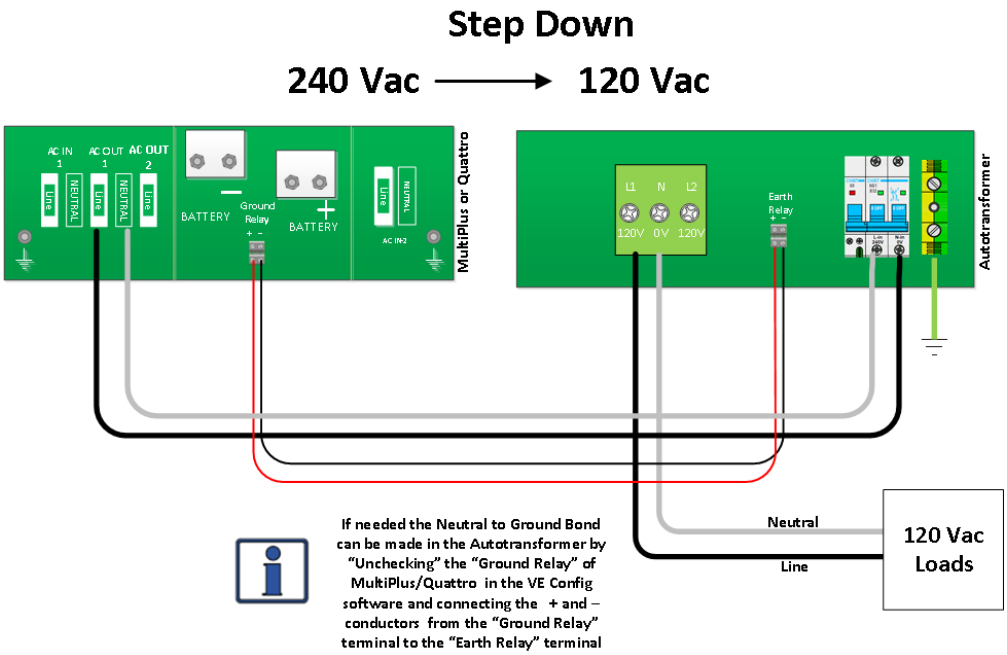
One case for using the autotransformer to step down voltage could be in installations that use a Split-Phase generator and a Single-Phase inverter, the autotransformer makes it possible to use all available power from both legs of the generator to power loads and to charge batteries.

When the available AC power source is not what is needed in the installation the autotransformer can create the needed voltage by decreasing the incoming voltage.

Other possible cases for stepping down the Voltage are shown in the wiring diagrams below.


Step Down
Generator 120/240 Vac
120Vac
L1 N L2
120V 0V 120V
Earth Relay
Autotransformer
Gen Neutral is Not Used
Neutral to Ground Bond Should Not be Connected in Generator
Line1
Line 2
Neutral
Line
120 Vac Loads
or
MultiPlus/ Quattro


Step Down
Dual Inverters 120/240 Vac
120Vac
AC IN 1
AC OUT 1
AC OUT 2
BATTERY
Ground Relay
MultiPlus or Quattro
L1 N L2
120V 0V 120V
Earth Relay
Autotransformer
Neutral
If needed, the Neutral to Ground Bond can be made in the Autotransformer by "Unchecking" the "Ground Relay" of both MultiPlus' or Quattro's in the VE Config software or Victron Connect App and connecting the + and – conductors from the "Ground Relay" terminal to the "Earth Relay" terminal
Neutral
Line
120Vac Loads



2.4. Ground Relay

In TT configurations, common in residential and mobile energy systems, the neutral (N) of the AC system is grounded. This setup enhances safety, enabling Ground Fault Circuit Interrupters (GFCIs) to trip during earth faults. The connection between neutral and protective earth (N-PE) facilitates current flow in secondary circuitry, which GFCIs detect, interrupting the circuit to prevent hazards.

In some systems, an autotransformer can also “create” a neutral different from the incoming neutral. It incorporates a ground relay for this purpose and can be controlled by an inverter/charger.

This involves the following:

- **For a MultiPlus or Quattro:** Deactivate the inverter/charger's internal ground relay via the SW1 slide switch next to the "ground relay" terminal block. In the inverter/charger settings, ensure that the ground relay is enabled; do not disable it. Then, connect the inverter/charger “ground relay” terminal block to the autotransformer "earth" terminal block using positive and negative conductors.
- **For a MultiPlus-II:** Deactivate the inverter/charger's internal ground relay by disabling the ground relay in the inverter/charger settings. Then, connect the inverter/charger “ground relay” terminal block to the autotransformer "earth" terminal block using positive and negative conductors.

Refer to sections 2.3.1 through 2.3.3 for examples using the ground relay.

Note that the inverter/charger uses 24V to control the autotransformer relay. It is important to note that this voltage is consistently 24V across all inverter/charger models, regardless of whether their rated voltage is 12, 24, or 48V.

2.5. Temperature Protected

In case of overheating, the autotransformer is disconnected from the supply. When the transformer is warm the fan will operate and the Red LED be illuminated. Disconnect some of the 120V load if this occurs.

When the transformer is overheated the MCB will switch off. The little blue switch will be out of the MCB.

To reset this manually cycle the circuit breaker.

2.6. Over Current Protection

In case of over current the MCB will switch off. Disconnect some of the load.



The MCB is for Over Current and Temperature Protection and switching the unit ON/OFF.

2.7. Sizing Limitations

The Autotransformer comes in two models, a 50A model and a 100A model. This value is defined in the amount of current there can be in pass through, so in other words the current which is forwarded without being converted. The transformer itself is equal in both models and has a 55A capacity (30 minutes) and 45A continuous. This is the maximal current that can be used to transfer energy from leg to leg or from 120Vac to 240Vac.

3. Installation

3.1. Installation Considerations

Ensure that the Autotransformer is used under the correct operating conditions. Never operate it in a wet or dusty environment. The AT is rated to IP21.

Ensure that there is always sufficient free space around the product for ventilation (10cm or 4 inches), and that ventilation openings are not blocked. See specification table for dimensions in Section 4.

Install the product in a heatproof environment. Ensure therefore that there are no chemicals, plastic parts, curtains or other textiles, etc. in the immediate vicinity of the equipment.

3.2. Mounting

Using a level if needed, install the wall hanger in the desired position with provided fasteners. Place AT on to wall hanger and pull down to achieve a snug fit. Install fasteners in the 2 holes provided at the lower portion of the enclosure.

The AT can be mounted in any orientation. Note that the Vertical position is the optimal orientation because it has maximum heat dissipation and easy access the terminal board.

3.3. Wiring

The Autotransformer has several possible configuration options and must therefore be installed correctly for the desired outcome. The terminal block may be used as an input for certain applications, and in other applications the terminal block is used as output.

Remove cover by removing 4 fasteners found in all four corners. Carefully remove front cover keeping in mind the 3 LED status lights.

See diagrams in Sections 2.3.1 through 2.3.4 for the placement of conductors that correspond with the desired configuration.

3.4. Conduit

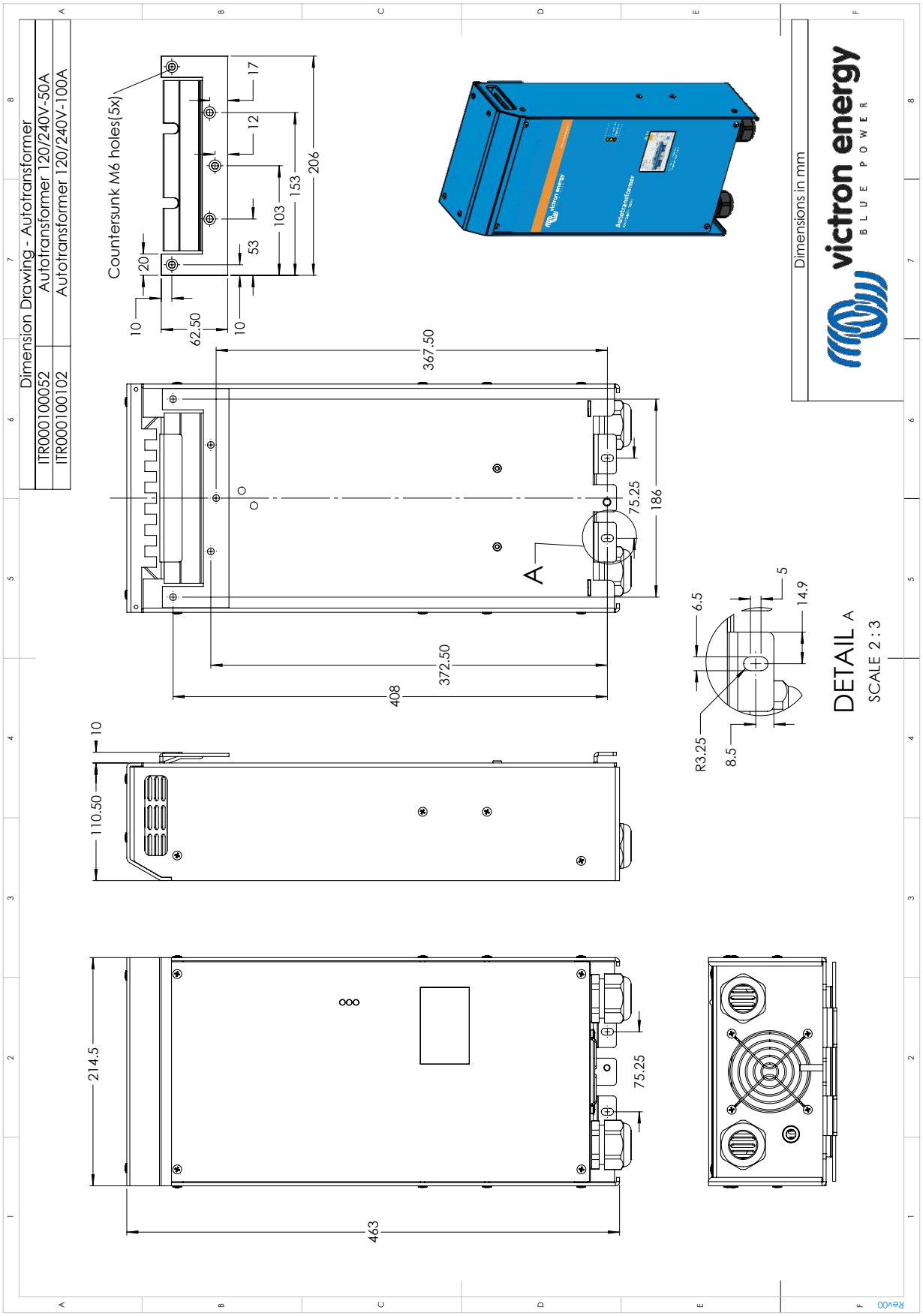
Both models of the AT can be fitted with conduit if required. For both models remove supplied cable glands/strain relief and replace with 1-1/4” NPT (National Pipe Thread) conduit fittings. See illustration below.



4. Specifications

Autotransformer	50 A	100 A
Input/output Voltage	120 / 240 V	
Input Circuit Breaker	50A, Two Pole	100A, Two Pole
Frequency	50/60Hz	
Maximum 240 V Feed Through Current	50A	100 A
Neutral Current, 30 min	55A @ 40ºC/100ºF	
Neutral Current, Continuous	45A @ 40ºC/100ºF	
Transformer Type	Toroidal	
Enclosure	Aluminum	
Input Circuit Breaker	Yes	
Electrical Terminals	Screw Terminals 35 mm² / AWG 2	
Protection Category	IP21	
Safety	EN 60076	
Weight	12,5 kg	13,5 kg
Dimensions (h x w x d)	460 x 214 x 110 mm	

5. Enclosure Dimensions



6. Warranty

This product has a 5-year limited warranty. This limited warranty covers defects in materials and workmanship in this product and lasts for five years from the date of original purchase of this product. To claim warranty the customer must return the product together with the receipt of purchase to the point of purchase. This limited warranty does not cover damage, deterioration or malfunction resulting from alteration, modification, improper or unreasonable use or misuse, neglect, exposure to excess moisture, fire, improper packing, lightning, power surges, or other acts of nature. This limited warranty does not cover damage, deterioration or malfunction resulting from repairs attempted by anyone unauthorized by Victron Energy to make such repairs. Non-compliance with the instructions in this manual will render the warranty void. Victron Energy is not liable for any consequential damages arising from the use of this product. The maximum liability of Victron Energy under this limited warranty shall not exceed the actual purchase price of the product.