



LITEON GROUP

# ***Chameleon™ Voltage Auto-Select Isolation Transformer***

*(120 VAC or 230 VAC Input or Output, 2 kVA)*



## **Installation and Operation Manual**

**MNL110**

*Rev 4.1*

**READ THIS MANUAL CAREFULLY  
SAVE ALL INSTRUCTIONS**

This manual contains important information that you will need to operate the *Chameleon™* safely and efficiently. Please read all instructions carefully before installing or operating equipment.

Keep this manual handy for easy reference.

**FCC Warning**

This equipment generates, uses, and can radiate radio frequency energy. Inherent limits provide protection against harmful interference when the equipment is operated in a commercial environment. The unit may cause harmful interference with radio communications if it is not installed or operated in accordance to this manual. Operation of this equipment in a residential area can cause interference, in which case the User will be required to correct the interference at his/her own expense.



**Caution**

Use only shielded interface cable when connecting to computer or peripheral devices.

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The *Chameleon™* is a registered trademark of Power Innovations International, Inc.  
This manual may accompany other instructional addendums about additional customizations or systems.  
Please contact Power Innovations if additional manuals are needed and have not been received.

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# 1—Introduction

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Congratulations on your purchase! Power Innovations strongly believes in the durability and quality of its products. The company hopes this product will serve you well for a long time.

## 1.1—Product Overview

The Chameleon auto-selects the input voltage (120 VAC or 230 VAC / 50 or 60 Hz) and provides a controlled output selectable voltage (120 VAC or 230 VAC / 50 or 60 Hz) for universal power standards.

This unique system adapts to the available form of global input power while conforming to universal output standards.

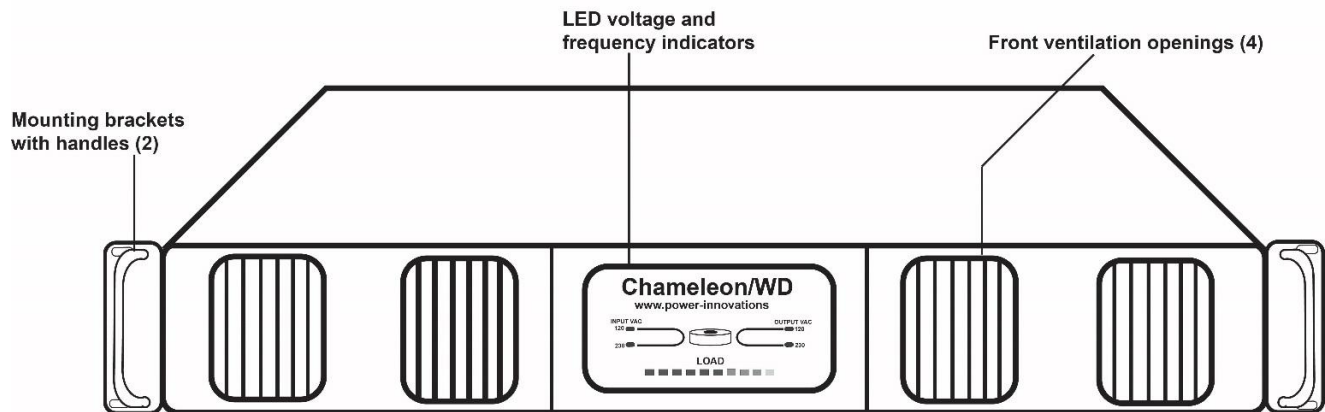
The Chameleon also fully isolates utility power and suppresses transients and surges that could harm connected equipment. It filters noise and monitors the connected load.



### Manual Helps

To read about input and output connections, see **Section 2, Unpacking and Installation.**

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## FRONT VIEW

*Figure 1—Key External Features*

### 1.1.1—Key Product Features

- Comprehensive TVSS surge suppression
- Extended product life
- Full downstream protection
- User output voltage selection switch
- LED voltage and frequency indicators

### 1.1.2—Safety Features

- Short circuit protection
- Over-temperature shutdown

### 1.1.3—Watchdog Feature

The Chameleon Watchdog feature is a sentinel circuit on the input that monitors voltage levels and stability. When a power source is connected to the Chameleon, the unit senses the incoming voltage and automatically sets the internal input circuits for the proper voltage range.

The Watchdog does not allow power to pass through the unit until the voltage is within the 115/120 VAC or 230/240 VAC range and stable for 30 seconds. Once the power has stabilized for 30 seconds, the Chameleon will release the output power.

### 1.1.4—Key Watchdog Features

- Over/under-voltage protection
- Input instability protection
- Auto input configuration

## 1.2—Using This Manual

This manual will show how to safely receive, unpack and install Power Innovations International, Inc.'s uninterruptible power quality (UPQ) Chameleon.

Read and understand this manual to make installing and operating the system as easy as possible.

## 1.3—Conventions Used in This Manual

To make this manual easier to read, several formatting conventions have been adopted.

### 1.3.1—Additional Advice

This manual will occasionally provide additional advice. When it is provided, this information will be enclosed by a set of lines to separate it from the rest of the text, like this:

---

This text does not belong with the rest.

---

Some of the information is very important, while other information may be good to know. To show the importance of each piece of information, the following symbols are used:

### ELECTRICAL WARNING



Denotes advice that, if not followed, could cause severe bodily harm or death due to electrical shock.

### WARNING



Denotes advice that, if not followed, could cause severe bodily harm or death due to other types of injury.

### Caution



Offers advice that, if not followed, may harm equipment or indirectly cause physical hazards.

Usually these symbols will be listed in order of importance. Other information is provided merely to be helpful.



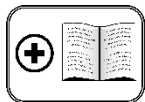
### Note

Offers practical advice that may be helpful but can be disregarded.



### Manual Help

Provides references to other manual sections or drawings that accompany this manual.



### Additional Manuals

Provides references to other manuals that may also be provided with this system.

## 1.3.2—Breaker Positions

Because some breakers share names with its subsystems or operation modes, breakers and their positions will be identified using all caps. Additionally, the words ON and OFF are always capitalized to stress which position is correct.

This convention exists to prevent the system components from becoming confused with names of breakers. Skimming the words that are capitalized can also serve as a quick-reference method for learning the functions of the breakers.

## 1.4—Safety Warnings and Cautions

This section provides important information that you will need to remember in order to safely operate your system. Read it carefully.

This manual provides very little information about maintaining the unit. Nothing inside of the chassis is user-serviceable.

All maintenance must be performed by a service technician at Power Innovations.

### 1.4.1—ELECTRICAL WARNINGS



DO NOT open the cover. There are no user-serviceable parts inside.

DO NOT insert any object into any of the ventilation holes (or any other openings) on the Chameleon.

### 1.4.2—WARNINGS



The Chameleon is intended for installation in a controlled environment.

For safety, read this manual carefully before operating the Chameleon unit. Follow all installation instructions and warnings.

### 1.4.3—Cautions



Obey all warnings within this manual. Failure to do so may void the warranty.

## 2—Unpacking and Installation

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Unpack the contents of the box carefully. Contents may be heavy.

Save all packaging for future needs.



### Caution

Not saving packaging may contribute to damage incurred during future packaged transport or shipping. This box was designed specifically for this product, and replacement packaging may not protect the product sufficiently. Any such resulting damage is not covered by the product warranty.

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### 2.1—Contents of Box

- Chameleon unit (1)
- Chameleon User's Manual (1)
- Input AC cable (1, if purchased)
- Output cable adaptors (4)

### 2.2—Installation Site

The Chameleon is typically installed in a rack system but may also be used in a standalone configuration.

The system will operate better if placed in a controlled environment. An indoor location may be the best, but the system can also be installed outdoors.

For the Chameleon to perform most reliably, it should be placed where:

- The temperature is less than 0 °C (32 °F).
- The humidity is less than 80% noncondensing.

The system can operate normally in other environments. Consider the following factors, however:

- The system can operate most normally in environments where the temperature is between 0 °C (32 °F) and 50 °C (122 °F).
- Avoid exposing the system directly to the elements (sunlight, rain, snow, sand, dust, wind).

#### 2.2.1—After Site Placement

Prior to startup, make sure that the Chameleon is in a location where water cannot damage the unit.

Before connecting any cables, be sure the INPUT breaker (located in the rear) is turned OFF.

## 2.3—Installing the Unit

### 2.3.1—Input/Output Overviews

Input and output connections are located on the rear side of the Chameleon.

1. The INPUT breaker
2. AC input receptacle
3. AC output receptacles with LED indicators

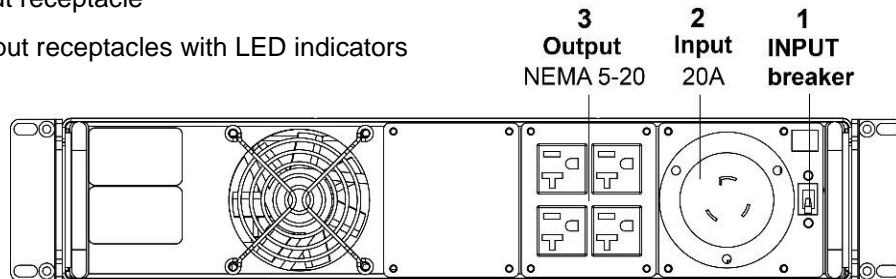


Figure 2—Rear View

### 2.3.2—Setup

1. Before connecting the AC power source to the input receptacle, be sure the INPUT breaker (in the rear) is turned OFF.
2. Connect the AC power source to the AC input receptacle.



#### ELECTRICAL WARNING

Standard electrical safety procedures should be followed while installing and operating this system.

### 2.3.3—Initial Startup

For questions about LED indicators, please see Operation.

1. Turn ON the INPUT breaker. The Chameleon will be turned ON, and the input LED for either 120 VAC or 230 VAC will illuminate.
2. Check that the correct LED illuminates to show the input voltage being provided.
3. The output LED will also illuminate. Check that the correct LED illuminates for the needed output voltage. If not, change the output settings using the provided output selection switch.
4. Turn the INPUT breaker OFF. The Chameleon is now OFF.
5. Connect the desired device to the output receptacle.

#### Caution



When connecting more than one output device to the Chameleon, verify that the connected devices do not create an overload condition, as indicated on by the red light the Load Light Bar (see **3.1.1—Indicator Overview**).

6. Turn the INPUT breaker ON again.
7. Turn ON the output device.
8. Verify that the output load indicator does not show overload or short circuit.

If no fault is present, the Chameleon is now operating correctly.

### **2.3.4—After Initial Startup**

Once the startup procedure is complete, the Chameleon should be left ON during normal operation. An output device can be turned ON or OFF without turning the Chameleon system ON or OFF.

To add or remove the devices, however, the Chameleon must be turned OFF.

## **2.4—Adding/Removing an Output Device**

### **2.4.1—Adding an Output Device**

1. Verify that the Chameleon is OFF.
2. Verify that all connected devices are OFF.
3. Follow Steps 3–8 of Initial Startup.

### **2.4.2—Removing a Device**

1. Verify that the Chameleon is OFF.



#### **ELECTRICAL WARNING**

**Always verify that the Chameleon and any output devices are OFF before adding/removing an output device.**

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2. Verify that connected devices are all OFF.
3. Carefully unplug the device from the output socket, making sure to handle all cables carefully.

## 3—Operation

### 3.1—Operating Temperature

Always operate the Chameleon within the correct temperature range, as specified in Product Specifications.

### 3.2—Using the LED Indicators

Factory output configurations vary and may include:

- 120 VAC and 230 VAC
- 120 VAC only
- 230 VAC only

If the factory settings exclude either input or output voltage, that voltage will not be able to light on the display indicators.

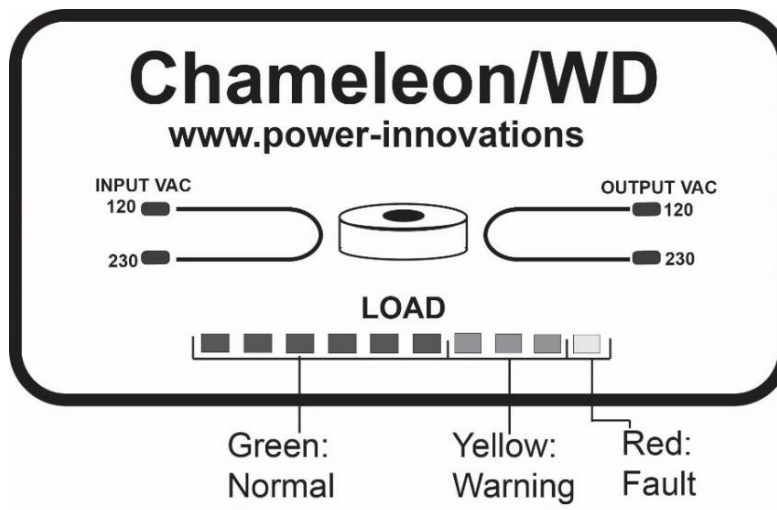


#### Manual Helps

For information about indicators, see Indicator Overview below.

#### 3.2.1—Indicator Overview

1. Input voltage indicator: 120 or 230 VAC / 50/60 Hz.
2. Output voltage indicator: 120 or 230 VAC / 50/60 Hz.
3. LED load indicator bar graph (Minimum (first green light) to maximum (red light) output power indicator).



**Figure 3—LED Load Indicator Colors**

## 3.3—Maintenance

The Chameleon is designed for maintenance-free operation and requires very little attention from users.

There are no user-serviceable parts inside. DO NOT remove the cover or attempt to service the Chameleon. Unauthorized service will void the warranty laid forth in this manual.

### 3.3.1—Cleaning

To ensure trouble-free operation, keep the unit clean by dusting the cover with a dry cloth. Keep vents clear of dust and build-up.

## 3.4—Troubleshooting

Due to its unique design, the Chameleon must be serviced only by authorized personnel. If the unit fails to operate properly, contact Power Innovations customer support.

If there is a problem with the Chameleon, refer to Table 1, Troubleshooting Guide before contacting Customer Service. If the problem cannot be resolved, contact Power Innovations Customer Service at (801) 785-4123.

**Table 1—Troubleshooting Guide**

Symptom	Problem	Solution
Front Panel LED display not working	Cables to display are loose or disconnected on either end.	Not user-serviceable. Contact Customer Service.
Incorrect output voltage	Toggle switch is set incorrectly	Verify that the toggle switch is in the correct position
	Incorrect input voltage	Verify system configuration and input voltage requirements
	Component failure	Not user-serviceable. Contact Customer Service.
No output voltage	INPUT breaker OFF	Turn ON breaker
	System is overheating	Allow the system to cool. It will restart automatically.  Verify that the system has adequate ventilation.  Make sure the system is not overloaded.  Make sure ventilation fans are working (if it has failed, call Customer Service).
	Cables to display are loose or disconnected on either end.	Not user-serviceable. Contact Customer Service.
	Component failure.	Not user-serviceable. Contact Customer Service.
Ventilation fan has failed	Component failure. System will be working but system may overheat.	Not user-serviceable. Contact Customer Service.

## 4—Product Specifications

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**Table 2—Product Specifications**

General		Rating
Input	Voltage range	120/240 VAC
	Maximum current	20/15 A
Output	Voltage range	120/240 VAC
	Maximum current	20/15 A
Input breaker switch		20 A
Overcurrent shutdown		20 A
Input auto-select threshold voltage		
From low line to high line		110–140 V
From high line to low line		230–250 V
Front panel display		
Input display		Yes (120/240 V)
Output display		Yes (120/240 V)
Load indicator		Yes—bar graph
Physical		
Weight		68 lb (31 kg)
Dimensions (W x D x H)		19" x 17.5" x 3.5"
Environmental		
Temperature		-22 to 140 °F (-30 to 60 °C)
Storage Temperature		32 to 176 °F (0 to 80 °C)
Humidity		0 to 95% non-condensing

## 5—Warranty

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### Limited Warranty

Power Innovations International, Inc. (hereinafter “PII”), warrants this product to be free from defects in material and workmanship for a period of one year from the startup date, provided initial power-up is performed by a PII certified technician. The initial power-up must be performed within six (6) months of the PII shipping date, and the product must be stored in a suitable environment prior to power-up, with batteries being charged as recommended. The warranty includes twelve-month (12) coverage of parts only. Various service contracts that cover parts, labor, and travel are sold separately.

This Warranty does not cover any product that has been misused, not operated or handled according to the instructions contained in the User's Manual, and/or which has been installed or serviced by an unauthorized technician.

### Repair or Replacement

If any part or portion of the PII product fails to conform to the Warranty within the Warranty period PII, at its option, will furnish new or factory remanufactured products for repair or replacement of that portion or part. Replacement parts or unit may be new or refurbished and will meet specifications of the original parts or unit.

### Legal Rights and Restrictions

This warranty gives you specific legal rights. You may also have other rights which vary from state to state. This warranty is limited to the original end user of the product and is not transferable. This warranty covers only PII-supplied components. Service required as a result of third-party components is not covered under this warranty.

### Proof of Purchase

Proof of purchase will be required by PII to substantiate date of purchase. Such proof of purchase must be an original bill of sale or receipt containing name and address of seller, purchaser, and the serial number of the product.

### Limitation of Remedies

PII's entire liability and the User's exclusive remedy will be repair or replacement of the unit if all conditions described under “Limited Warranty” have been met. In no event will PII be liable for indirect, special, incidental, consequential, or exemplary damages of any kind whatsoever arising out of the use of this unit, including without limitation, lost profits, business interruption, or loss of data, whether any claim is based upon theories of contract, negligence, strict liability, tort, or otherwise.

### Incidental Damages

In no event will PII be liable for indirect, special, incidental, consequential, or exemplary damages of any kind whatsoever arising out of the use of this unit, including without limitation, lost profits, business interruption, or loss of data, whether any claim is based upon theories of contract, negligence, strict liability, tort, or otherwise.

## Warranty Claims

### Customer Support

Questions concerning the operation, repair or maintenance of this equipment should be directed to the Service Department of Power Innovations International, Inc. (hereinafter "PII"). When making such an inquiry, provide the Service Department with the model number, serial number, and approximate date of receipt of the equipment.

### Making a Claim

Within a reasonable time, but in no case to exceed thirty (30) days, after discovery of a defect, the purchaser shall contact PII at 801-785-4123. It is the obligation of the purchaser to have the product shipped, freight prepaid, or delivered to the authorized reseller from whom it was purchased, or other facility authorized by PII to render the services provided hereunder in the original package. All products returned to PII for service MUST have prior approval, which should be obtained by calling 801-785-4123.

### Claim Restrictions

The product must not have been previously altered, repaired, or serviced by anyone other than a service facility authorized by PII to render such service, and the serial number of the product must not have been altered or removed. To be covered by this warranty, the product will not have been subjected to accident, misuse or abuse, or operated contrary to the instructions contained in the User's Manual. Any such conditions will void this warranty.

### Prior to Any Return

If it is deemed necessary to return this equipment to the factory for servicing, contact the Customer Support Department for authorization and an RMA number.

## Contacting Power Innovations

If there are any questions or comments about this product, please feel free to contact us.

**Power Innovations International, Inc.**

Tel: (801) 785-4123

Fax: (801) 785-6999

Email: [support@power-innovations.com](mailto:support@power-innovations.com)

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