

# Chameleon 4.4 kW Module and Modularized 2U x 19 in 4.4 kW-8.8 kW Power Rack



## User Manual

MNL205

Rev 1.3

## **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.

### **Safety Certification**



This device has been safety tested by TÜV Rheinland and certified to UL 62368-1.

### **Supplier's Declaration of Conformity (SDoC)**



This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Operation of this equipment in a residential area may cause interference, in which case the User will be required to correct the interference at his/her own expense.

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### **Caution**



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

This equipment is not suitable for use in locations where children are likely to be present.

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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 has designed this product to ensure excellent quality and durability. The Chameleon 4.4. comes to you ready to be installed.

## 1.1—Product Overview

The Chameleon™ is a product family of 19-inch rack mounted transformers that provide power conversion and distribution in a data center environment. This manual covers the 4.4 kVA auto-transformer module. Up to two 4.4 kW modules can be installed in a 2U 19-inch rack space for a total of 8.8 kW per shelf (a separately sold accessory). When using a shelf with only one transformer installed, an accessory Blank Plate may be purchased.

### 1.1.1—Key Product Features

- Power conversion from 277 VAC to 240 VAC single phase.
- Up to two 4.4 kW transformers per shelf for a total of 8.8 kW in 2U of rack space.
- Output Power Distribution with IEC 60320 C19 locking connectors.
- Full downstream power protection with secondary distribution breakers.
- Extended product life (see Warranty at the back of this manual).

### 1.1.2—Auto-Transformer Module Product Specification Summary

- **Input Receptacles:** One 277 VAC INPUT connection for each transformer module via a locking Anderson Power Products Saf-D-Grid 3000 600V PN 2326G4-BK, Key B, Black receptacle. User supplied INPUT cables should mate with this receptacle.
- **Output Receptacles:** Two 240 VAC connections per transformer module using C19 locking mechanisms to keep cables secure. No locking mechanism required on the user supplied cables.
- **Circuit Protection:** Each OUTPUT receptacle has its own branch rated circuit protection.
- **Captive Screws** on the rear of each shelf hold the transformers in place.
- **Ventilation:** Each module features a fan exhaust system. A 24 VDC power supply provides power to fan.
- **Fuse Protection:** A slow blow fuse protects the 24 VDC power supply. It can be easily accessed and replaced from the rear of each module (**Figure 6**).

### 1.1.3—Product Accessories

- **Shelf:** the shelf is designed to hold one or two transformer modules and be placed on user-supplied L-bracket rails.
- **Blank Plate:** The Blank Plate is an air dam that can be used to block air flow through the other side of a shelf that houses only one transformer module.

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## 2—Installation

### 2.1—Shelf Installation

#### 2.1.1—Rail Installation

If the shelf is being installed in a rack, appropriate rails that support at least 120 lbs. should be installed prior to mounting the shelf to the rails (section 2.1.2—Shelf Installation).

#### 2.1.2—Shelf Installation

The Shelf is intended be installed in a 2U rack before the auto-transformer modules are installed. Install the Chameleon™ 4.4 SHELF using standard rack mounting hardware, e.g. 10-32 pilot screws (user provided).



*Figure 1—Chameleon™ Shelf*

### 2.2—Auto-Transformer Modules

The Chameleon™ 4.4 Shelf supports up to two auto-transformer modules (Chameleon 4.4-TRX-020P2A00).

#### ELECTRICAL WARNING



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

#### 2.2.1—Installing an Auto-Transformer Module

1. Verify all the Chameleon™ 4.4 breakers are OFF (Open).



*Figure 2—Shelf Back Showing Captive Screws*

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2. Push the module into the shelf until the rear of the transformer touches the two brackets on the rear of the shelf (**Figure 2**).
3. Fasten the transformer module to the shelf by tightening the two captive screws per module (Figure 2).
4. Connect a user provided compatible C19 (**section 1.1.2**) OUTPUT cable into J1 or J2 (Figure 3) at the back of the module. The OUTPUTs J1 and J2 correspond with their respective breakers, S1 and S2 (Figure 4).
5. Connect a user provided INPUT cable compatible with an Anderson Power Products Saf-D-Grid 3000 600 V PN 2326G4-BK, Key B, Black receptacle.



**Figure 3—Chameleon™ 4.4 Module (Rear)**



**Figure 4—Chameleon™ 4.4 Module (Front)**



**Caution**

ONLY use the transformer module pull handle (**Figure 4**) to aid in pulling the module out of the shelf. It is not a carrying devise.



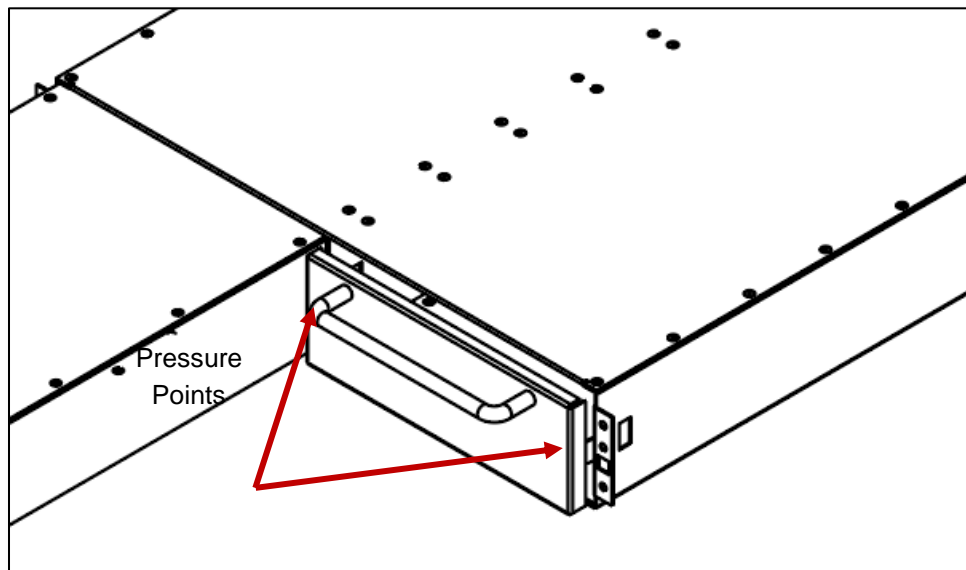
## 2.2.2—Removing an Auto-Transformer Module

1. Verify all the Chameleon™ 4.4 breakers are OFF.
2. Disconnect all cables from the Module.
3. While at the rear of the cabinet, unscrew the captive screws at the rear of the transformer module and pull the handle to help remove the module (Figure 4) from the shelf.
4. Remove the module from the shelf remembering to support the module from underneath.

## 2.2.3—Blank Plate

If a module space remains empty, a Blank Plate may be purchased from Power Innovations to act as an air dam for the rack. Follow these instructions to install the Blank Plate:

1. Gently place the Blank Plate into position at the front of the Shelf (Figure 5).
2. Press the Blank Plate at the pressure points shown in **Figure 5** into the Shelf until it snaps in place.



*Figure 5—Blank Plate*

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## 2.3—Connecting/Disconnecting a PDU or Output Device to the Module

### 2.3.1—Adding an Output Device/Load

1. Verify that all connected devices are OFF.
2. Verify that the Chameleon™ 4.4 secondary breakers (S1, S2) associated with the OUTPUT receptacles (J1, J2) are OFF.
3. Plug in the device with a user supplied C19 INPUT cable.
4. Turn ON the secondary breaker (S1 or S2) for its respective receptacle (J1 or J2).

### 2.3.2—Removing a Connected Device

1. Verify that all connected devices are OFF.
2. Verify that the Chameleon™ OUTPUT breaker associated with the OUTPUT receptacle is OFF.
3. Carefully unplug the device from the OUTPUT receptacle by pressing the red C19 disconnect button.

## 3—Operation

### 3.1—System Breakers

The Chameleon™ 4.4 is equipped with a 20-amp INPUT breaker and two 20-amp OUTPUT breakers (S1-S2).

#### 3.1.1—Startup

1. Turn ON the 20-amp MAIN breaker (INPUT breaker).
2. Turn ON the desired 240 VAC OUTPUT breakers.

Once the startup procedure is complete, the Chameleon™ 4.4 should be left ON during normal operation. An OUTPUT device can be turned ON or OFF without using the Chameleon OUTPUT breakers.

### 3.2—Maintenance

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



#### Caution

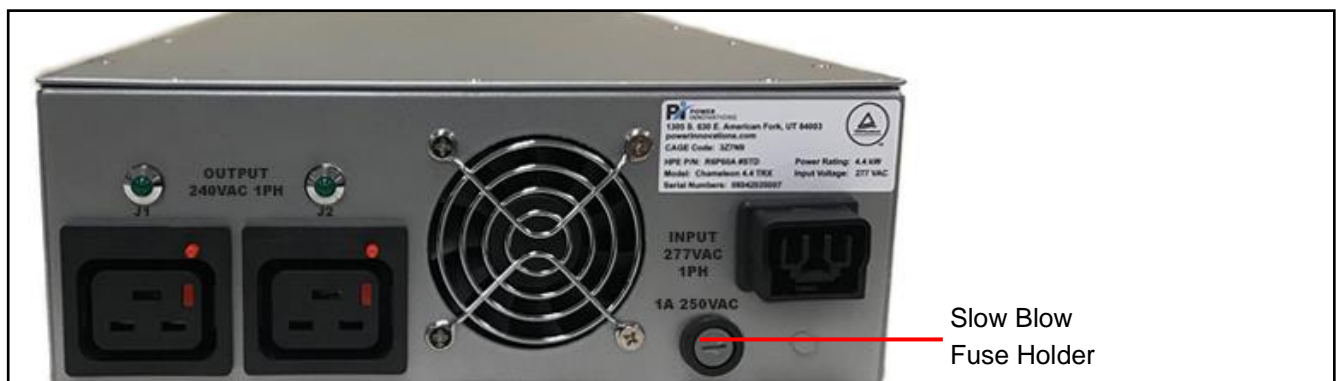
There are no user-serviceable parts inside. DO NOT remove the cover or attempt to service the Chameleon. Unauthorized service will void the warranty laid forth in this manual.

#### 3.2.1—User Serviceable Components

There are no user servable components in the Chameleon™ 4.4 auto-transformer modules except for the slow blow fuse (section 3.2.1.1). If there is a problem, replace the transformer with a spare and call Power Innovations for an RMA number. Then return the unit to Power Innovations noting the RMA number.

##### 3.2.1.1—Slow Blow Fuse

If the fan's Slow Blow Fuse (**Figure 6**) needs to be replaced, simply press in on the fuse and turn counterclockwise until the fuse holder releases. Replace the blown fuse using a 1 amp, 250 VAC replacement fuse (**Figure 6**).



**Figure 6—Slow Blow Fuse Location on Back of Chameleon 4.4**

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### 3.2.2—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.

## 3.3—Troubleshooting

Due to its unique design, the Chameleon must be serviced only by authorized personnel, except for the fan fuse (see **section 3.2.1.1**). 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
No OUTPUT voltage.	INPUT breaker tripped.	Ensure the INPUT breaker is ON.
	Either OUTPUT breaker (S1 or S2) tripped.	Reset the OUTPUT breaker to ON. Check to verify that the sum of the two OUTPUT loads is under 23 amps.
	Component failure.	No user-serviceable. Contact Customer Service.
Cooling fan has ceased functioning.	The fan fuse has blown.  The 24 VDC fan power supply has failed.	Replace the fuse on the rear of the module ( <b>Figure 6</b> ).  Call customer service for an RMA and return the module to Power Innovations for repair.

## 4—Product Specifications

**Table 2—Product Specifications**

<b>Output</b>	
Capacity (kVA)	4.4 (maximum 8.8 for two auto-transformer modules)
Capacity (Watts)	4,400 W (8,800 W maximum with two auto-transformer modules)
Nominal Voltage (1 phase)	240 VAC
Frequency	60
Connection Method	Two C19 locking receptacles
Output Circuit Protection	20 amp, Rocker Style
<b>Input</b>	
Current (amp)	20
Voltage	277
Frequency	60
Connection Method	APP Saf-D-Grid 3000 600V PN 2326G4-BK, Key B, Black
Input Circuit Protection	20 amp, Rocker style
<b>Certifications</b>	
NRTL (TUV us)	Listed to UL 62368-1
CE	Upon Request
<b>Environmental</b>	
Efficiency	>98%
Maximum Heat Dissipation W	<90
Maximum Heat Dissipation BTU/hr	<300
Operating Temperature Derating 7 °F (4 °C) for every 3,281 ft (1,000 m) above sea level	-14 to 158 °F (-10 to 70 °C) Up to 6,600 feet (2,000 m)
Humidity	0% to 90% non-condensing
Ambient Noise	40 dBA at 1 meter
<b>Physical</b>	
Shelf Accessory W x D x H (inches)	17.72 x 20.08 x 3.39 (45 x 51 x 8.61 cm)
Shelf Accessory Weight	23 lb (10.43 kg)
Transformer Module W x D x H (inches)	8.69 x 22.08 x 3.14 (22.07 x 56.08 x 7.96 cm)
Transformer Module Weight	46 lb each (20.87 kg)

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## 4.1—Chameleon™ 4.4 Parts

The Chameleon™ is composed of various parts. A comprehensive list of included and optional parts can be found in **Table 3** below.

**Table 3—Product Ordering Information**

	Part	Description	Part Number
1	Transformer Module	4.4 kVA Transformer.	Chameleon 4.4-TRX-020P2A00
2	Shelf	Steel enclosure to hold the Transformer Modules (up to two Modules per shelf).	Chameleon 4.4-SHELF
3	Blank Plate	Modesty cover for open slots (e.g. a Shelf with only one Module).	Chameleon 4.4-BLANK
4	Slow Blow Fuse	1 Amp, 250 VAC, Slow Blow, 0.25 in x 1-0.25 in, Glass type	MDL-1-R
Below is an example list of user supplied parts (sold separately/nonorderable from Power Innovations).			
a	Mounting Rail x2	Supports Shelf. The support rails are not part of the product. The user should supply rails that support up 120 lb.	User Supplied
b	Input Cable	Needs to mate with the input connector (APP Saf-D-Grid 3000 600V PN 2326G4-BK, Key B, Black)	Example: APP SDG300 A-B Jumper Cord P/N 2352-1112-10
c	Output Cable	Any standard IEC60320 C19 Male plug terminated cable.	User Supplied



## 5—Warranty

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### Limited Warranty

Power Innovations International, Inc. (hereinafter “Power Innovations”) warrants this product to be free from defects in material and workmanship for a period of five years from the date of purchase. The warranty also includes 60-month coverage on parts only.

### Repair or Replacement

If any part or portion of the Power Innovations product fails to conform to the Warranty within the Warranty period, Power Innovations, 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 Power Innovations-supplied components. Service required because of third-party components is not covered under this warranty.

### Proof of Purchase

Proof of purchase will be required by Power Innovations 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

Power Innovations’ 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.

### Incidental Damages

In no event will Power Innovations 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. 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 days, after discovery of a defect, the purchaser shall contact Power Innovations 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 Power Innovations to render the services provided hereunder in the original package. All products returned to Power Innovations 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 Power Innovations 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

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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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