



**OPR Power Series™**  
AC to DC POWER SUPPLY SERIES WITH RELAY CLOSE CONTACT  
REMOTE MANAGEMENT ALARM SYSTEM

**Model No. OPR300-24SN**

(Negative) –24V, 300 Watt Single Power Supply

Manual

Revision E

August 2009

Optimal Power Supplies LLC

[www.optimal-power.com](http://www.optimal-power.com)

## **PROPRIETARY DATA**

All data in this manual is proprietary and may not be disclosed, duplicated or used for procurement or manufacturing purposes, without prior written permission by  
**OPTIMAL POWER**

## **LIABILITY**

**DO NOT OPERATE OR SERVICE THE OPR300-24SN MODEL WITHOUT READING THIS ENTIRE MANUAL FIRST**

Optimal Power Supplies LLC is not responsible for any kinds of damages sustained through the use of this or any other Optimal Power Supplies LLC products. It is entirely the customer's responsibility to take all the necessary precautionary measures when installing this unit.

## **WARRANTY**

Optimal Power warrants all of its products against defects in materials and workmanship for one year from date of delivery. We will repair, or replace parts which prove to be defective during the warranty period provided that:

1. A Return Maintenance Authorization (RMA) is obtained from OPTIMAL POWER at (251) 209-8088 or [www.optimal-power.com](http://www.optimal-power.com). Please reference your RMA number on the outside of the box the item is shipped in.
2. Shipping charges are pre-paid by customer.

Optimal Power does not endorse any other warranty, expressed or implied, and is not liable for consequential damages. Products that are damaged, opened, or modified do not qualify for a warranty. The same procedures must be followed for repairs outside the warranty period.

# TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
<b>1</b>	<b>OPR Power Series – Introduction .....</b>	<b>1</b>
1.1	Product Description.....	1
1.2	Main Features.....	1
1.3	General OPR Power Series Specifications.....	2
1.4	Typical Safety Rating.....	2
<b>2</b>	<b>OPR300-24SN.....</b>	<b>3</b>
2.1	OPR300-24SN Description.....	3
2.2	Specifications .....	3
<b>3</b>	<b>Status Indicators and Back Panel Connections.....</b>	<b>5</b>
3.1	Back Panel DC Power Connector.....	5
3.2	Front Panel Status Indicators.....	5
3.3	Remote Management Terminal Block Pin Out.....	5
<b>4</b>	<b>Alarm Systems.....</b>	<b>6</b>
4.1	Alarm Monitoring System.....	6
4.1.1	Alarm Monitoring System Example.....	7
<b>5</b>	<b>Installation and Maintenance.....</b>	<b>8</b>
5.1	Installation.....	8
5.2	Maintenance.....	9
5.3	Warnings.....	9
<b>6</b>	<b>Images.....</b>	<b>10</b>
6.1	OPR300-24SN.....	10
6.2	OPR300-24SN (Front View/Rear View).....	11
6.3	DC Cable Image.....	12

# **Chapter 1**

## **OPR Power Series - Introduction**

### **1.1 Product Description**

OPR Power Series is a unique and a highly reliable power supply series. It can be configured as a single as well as a fully redundant power supply. OPR Power Series is designed for Universal AC to DC power supply applications. Because of this feature these power supplies can be used anywhere in the world. These power supplies are mainly used in the following applications:

- Computer Peripherals and Networking Applications
- Telecommunications and Fiber Optic Network
- Voice, Data and Analog Communications
- Universities and Educational Facilities
- Instrumentation and Electronics
- Utility and Power Industries
- Data Acquisition
- Medical
- Military

OPR Power Series is a reliable, efficient and inexpensive solution for all kind of AC to DC power supply applications.

### **1.2 Main Features:**

- Compact Rack Mount Size (1.75" H x 19" W x 12.12" D)
- Universal AC (Alternate Current) Input
- Filtered IEC AC Inlet Connectors
- EMI FCC Class B Clearance for Internal Power Bricks
- Single and Multiple Output
- Highly Efficient Design
- 1U Low Profile Height
- NO Minimum Load Required
- Relay Contact Closure Remote Management
- Low Voltage Power Supply Alarm
- Cost Effective and Reliable Power Supply Solution

### 1.3 General OPR Power Series Specifications:

Input Voltage.....	Universal 90VAC to 264VAC
Input Frequency.....	47Hz to 63Hz
Operational Temperature.....	0°C to 55°C
Storage Temperature.....	-20°C to 85°C
Cooling.....	Convection Cooling
Overload Protection.....	Auto-Recovery
Efficiency.....	80-90% Typical
DC OK.....	Status LEDs

### 1.4 Typical Safety Rating for Internal Power Modules:

Designed in full compliance with.....	UL60950
	CSA 22.2 No. 234
	EN60950
EMI.....	EN55022 “Class B”
EMS.....	EN61000-4-2,-3,-4,-5,-6,-8,-11
Harmonics.....	EN61000-3-2 Class D



**1U Power Supply**

**Shown above: Model OPR300-24SN**

## 2.1 OPR300-24SN Description:

The Model OPR300-24SN is a 1U rack mountable power supply designed to operate in (negative) –24V, 300W power configuration. OPR300-24SN has one built-in universal AC to –24V DC power supply with one IEC AC input socket. The OPR300-24SN Model can provide up to 300W of power to the system it is attached. Model OPR300-24SN is only designed for 300W applications. The internal power module has its own AC-INLET, ON/OFF switch and associated alarm and DC power LED. OPR300-24SN Model has a built-in alarm circuit with red LED for low DC power monitoring. In addition, Model OPR300-24SN has relay contact closure terminal block interface for remote power supply alarm management.

## 2.2 Specifications:

### Electrical

Output Voltage	–24VDC
Output Ripple	Typical 200 mV
Output Current	Typical 12A max
Output Power	300W of single power
Input Voltage	Universal 90VAC to 264VAC input
Input Frequency	47Hz to 63Hz
Input Current	Approx. continuous 3 Amps.
Current Tolerance	0.5%
Remote Management Interface	Terminal block connector Pins 2 and 3 (Relay contact closure)

### Typical Safety Ratings for Internal Power Modules:

Designed in full compliance with	UL60950 CSA 22.2 No. 234 EN60950
EMI	EN55022 “Class B”
EMS	EN61000-4-2,-3,-4,-5,-6,-8,-11
Harmonics	EN61000-3-2 Class D

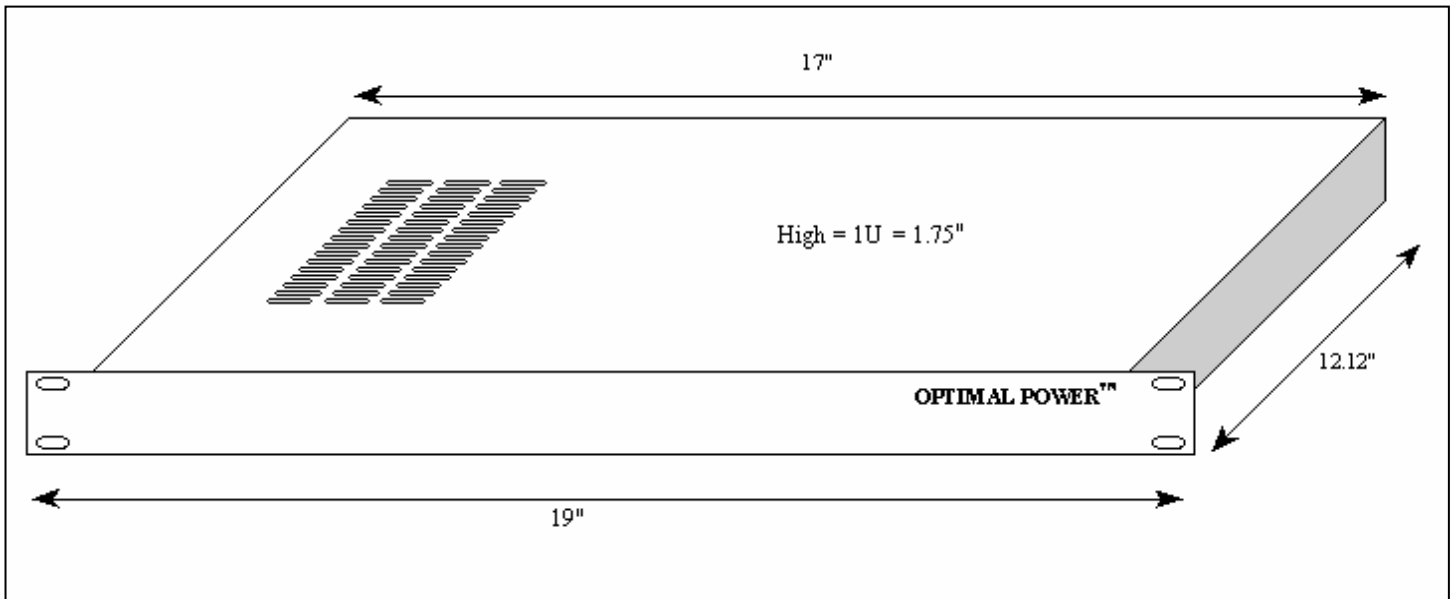
## Environmental

Overload Protection	Auto-recovery
Functional Temperature	0 to 70 °C
Storage Temperature	-20 to 85 °C
Over voltage Type	Latch off
Efficiency	80-90% Typical

## Physical

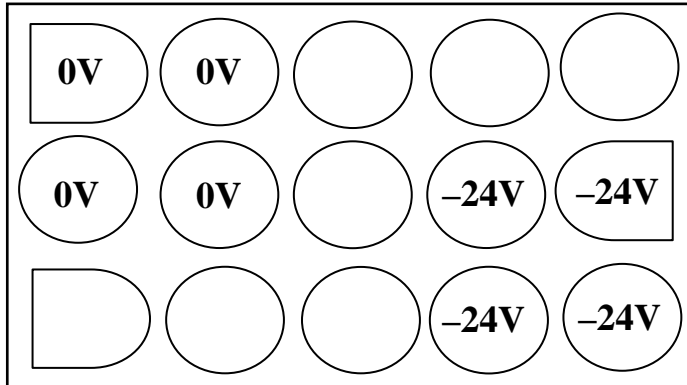
Dimensions	1U (1.75" H x 19" W x 12.12" D)
Weight	Approx. 13.25 lb = 6.01 kg = 212 oz

## Dimensional Figure



**Status Indicators and Back Panel Connections**

**3.1 Back Panel DC Power Connector**



**WARNING:**

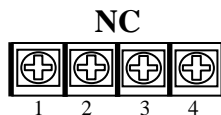
**Observe polarity when making connection to the rear of the Model OPR300-24SN**

**3.2 Front Panel Status Indicators**

LED	Description (When Lit)	OPR300-24SN Indicators
Solid Green	Power Supply Activated	Power 1
Solid Red	Power Supply Failure	PS 1 Alarm

**3.3 Remote Management Terminal Block Pin Out\*\***

Relay Contact Closure	Normal Operating Condition	Alarm Condition / Off Position
Pin # 2	Open Circuit	Short Circuit (Shorted to pin 3)
Pin # 3	Open Circuit	Short Circuit (Shorted to pin 2)



**Note \*\*** Pins not mentioned in the table do not have any connections

To understand the power and data alarm systems, please refer to the section 4.1 on next page.



### **4.1 Alarm Monitoring System**

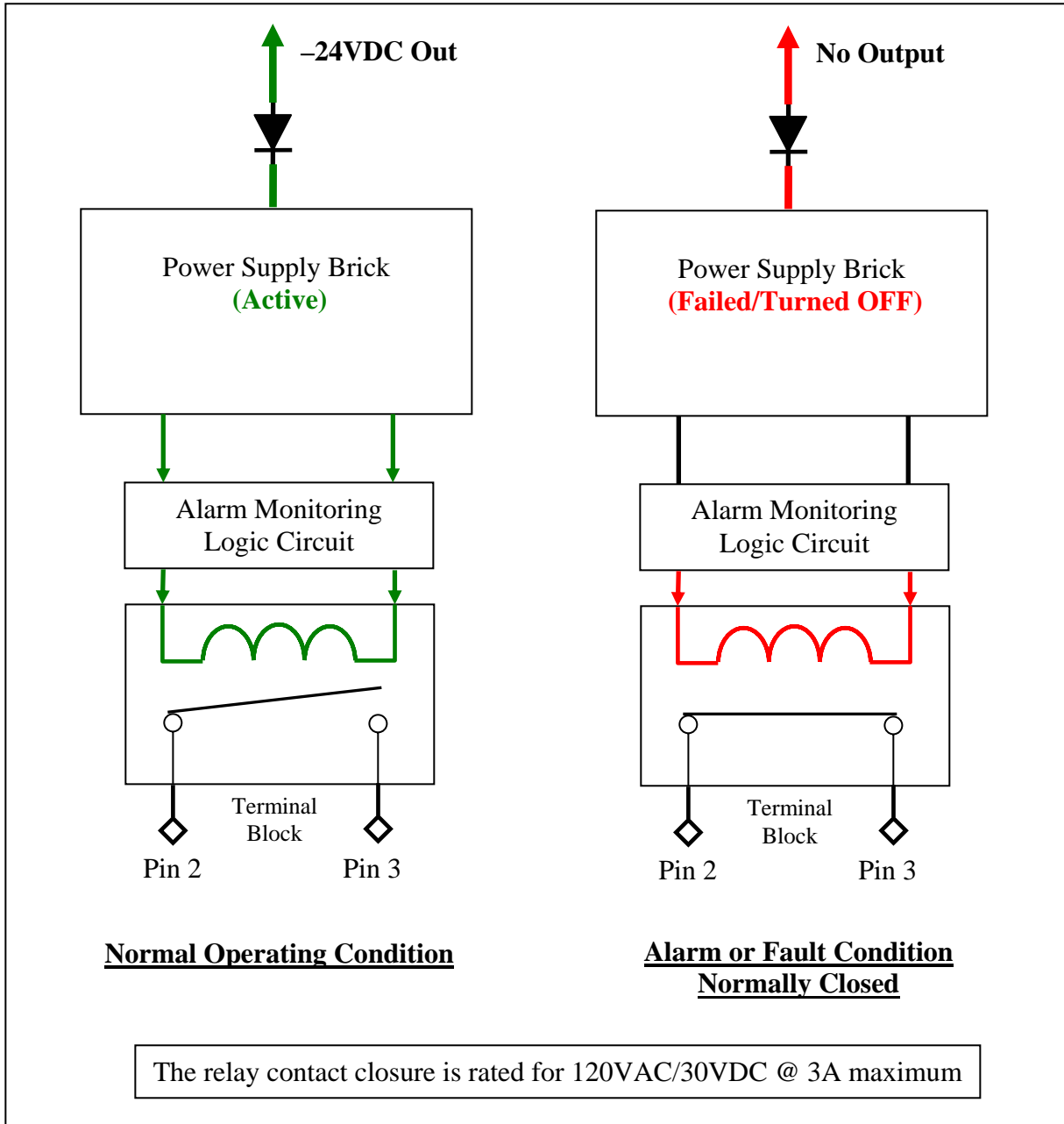
The Model OPR300-24SN has the ability to monitor output DC voltage, and trigger an alarm when the output DC voltage starts to fail or the internal power brick is turned OFF. If for some reason the power supply voltage drops (due to overload or front panel switch in OFF position), the relay contact closure terminal block interface pins 2 and 3 are shorted together indicating power supply failure. The contact closure is rated for 120VAC/30VDC @ 2A maximum. Furthermore, there is also “PS 1 Alarm” LED associated with the internal power supply indicating output power failure status. The alarm conditions are summarized as follow:

**Alarm Conditions**

- Power Failure
- AC plug disconnected to the Power Supply
- Front panel power switch is in “OFF” position

Refer to next the page for an alarm monitoring system example.

### 4.1.1 Alarm Monitoring System Example



## Chapter 5

# Installation and Maintenance

### 5.1 Installation

Model OPR300-24SN may be installed in fixed, semi-fixed and mobile environments that meet the environmental characteristics specified in Chapter 2. This Model is designed to be mounted in a standard 19” equipment rack utilizing the mounting holes provided on the front of the unit. **It is recommended that at least 1 rack unit (1U = 1.75”) gap be provided above or below the OPR power supply unit for proper air flow.**

Once the power supply is mounted in the rack, it should be connected to the system (**that only requires –24VDC power**) with the DC output connector located at the rear of the OPR unit.

**WARNING: Observe polarity when making connection to the rear of Model OPR300-24SN**

- Next, ensure that the front panel power switch is in “OFF” position.
- Connect the AC power cord to the unit by plugging the free end of the power cord into a standard three prong AC outlet.
- Ensure that the AC power plug located at the rear end of the power supply is connected to a clean and well-grounded Universal AC source.

Once all the wires are connected properly:

Turn “ON” the front panel switch for the power supply

The “Power 1” green LED should light up. Indicating Power supply is “ON” and working properly

Now the system is ready to operate to its required purpose.

#### Monitoring AC Input and DC Output

OPR Series Models has a switch that monitors AC current input and DC current output. Whenever the “Power” switch is “ON”, the LED embedded in the switch should light up. This indicates good AC input. Similarly the “Power 1” LED should turn green, indicating good DC output current.

## 5.2 Maintenance

The Model OPR300-24SN should be treated with the sufficient care.

- Do not use abrasives or solvents, as they may mar surfaces
- Do not subject the unit to excessive temperature extremes
- Do not subject the unit to excessive moisture or spilled liquids
- Do not subject the unit to sudden or severe shocks
- Never operate the Model OPR300-24SN with any of the covers removed

## 5.3 Warnings

To reduce the risk of fire, electric shock or product damage, **DO NOT** expose the Model OPR300-24SN to direct heat, rain, moisture, dripping or splashing. **DO NOT** place any object filled with any kinds of liquids on the unit. To prevent damage to LEDs and switches, **DO NOT** place the front panel of the unit face down, and/or **DO NOT** press against the front panel.

Optimal Power Supplies LLC is not responsible for any kinds of damages sustained through the use of any of its products.

**6.1 OPR300-24SN (300W Single Power Supply Shown Here)**

**Front View**



**Rear View**

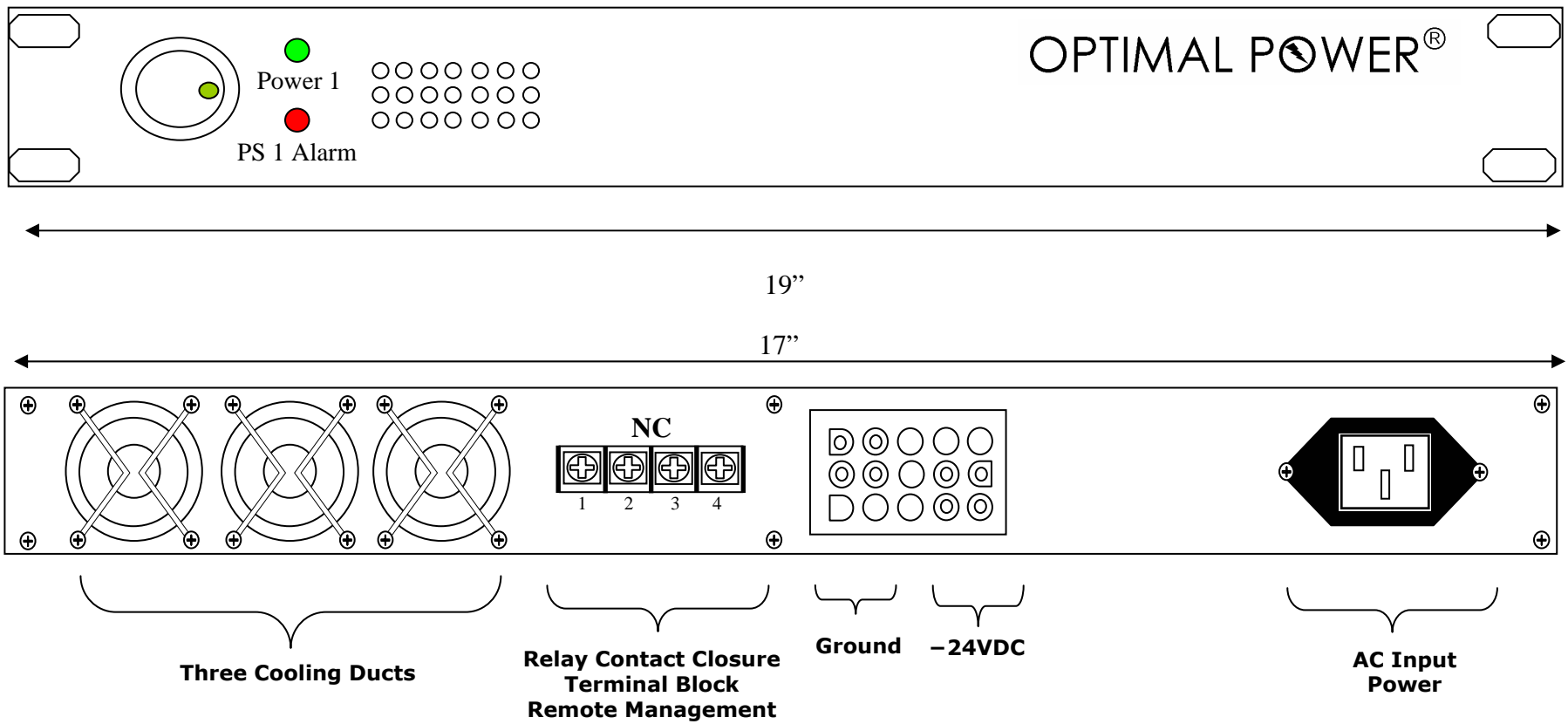


**Overall View**



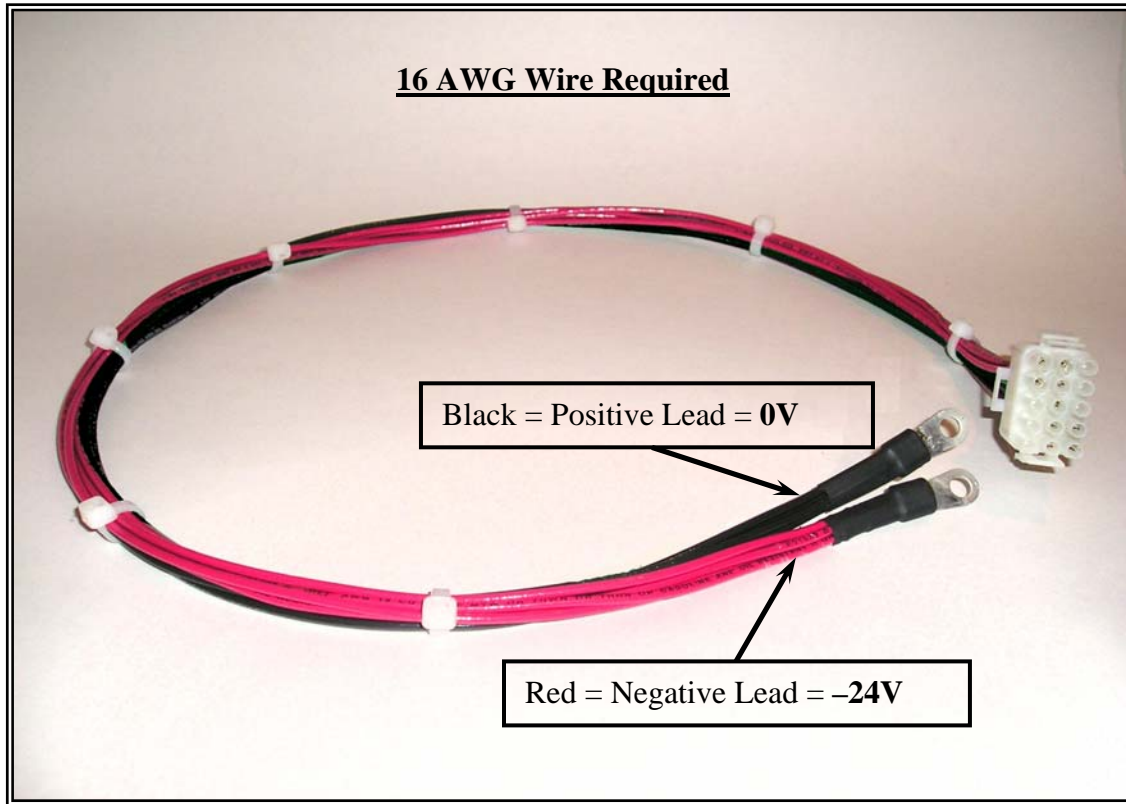
## 6.2 OPR300-24SN (Front View/Rear View)

LED	Description (When Lit)	OPR300-24SN Indicators
Solid Green	Power Supply Activated	Power 1
Solid Red	Power Supply Failure (or) Power 1 Switch is in OFF position	PS 1 Alarm

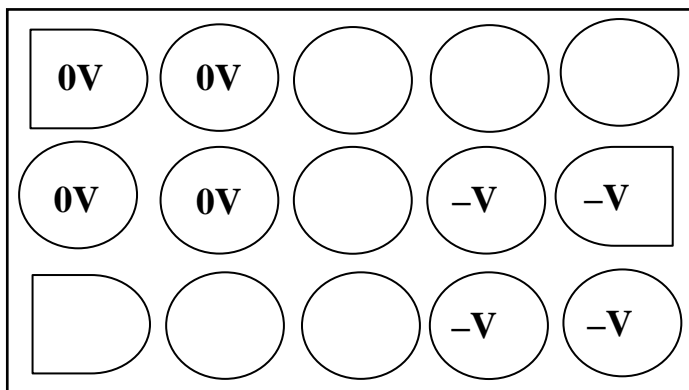


Pin 2 = Contact Closure  
 Pin 3 = Contact Closure  
 120VAC or 30VDC @ 3A

### 6.3 DC Connection Cable



**Important:** For proper current flow make sure to connect all the specified power terminals



**WARNING:**

**Observe polarity when making connection to the rear of the Model OPR300-24SN**

0V = Indicates Ground Line  
-V = Indicates Negative 24VDC