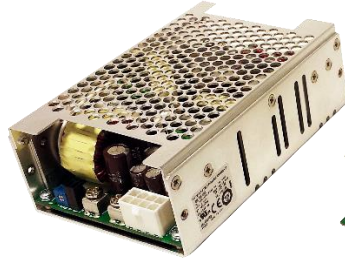


# 200 WATTS

## MULTI OUTPUT AC-DC

### FEATURES:

- Compact 3.0" x 5.0" x 1.3" Size
- 3 Year Warranty
- Universal 85-264V Input
- Dual, Triple or Quad Outputs
- 90% Peak Efficiency
- 86% Average Efficiency
- <300mW No Load Input Power
- RoHS Compliant
- IEC 60601-1 3<sup>rd</sup> ed. Medical Cert.
- IEC 60950-1 2<sup>nd</sup> ed. ITE Certification
- IEC 62368-1 2<sup>nd</sup> ed. Certification
- IEC 60601-1-2 4<sup>th</sup> ed. EMC
- Class B Emissions per EN55011/32
- -20 to +70°C Operating Temperature
- Optional Power Fail Warning
- Optional Chassis/Cover



CHASSIS/COVER



OPEN FRAME

### SAFETY SPECIFICATIONS



Underwriters Laboratories  
File E137708/E140259

UL 62368-1:2014, 2<sup>nd</sup> Edition  
CAN/CSA-C22.2 No. 62368-1-14  
AAMI/ANSI ES60601-1:2005/(R) 2012  
CAN/CSA-C22.2 No. 60601-1:2014



CB Reports/Certificates (including all  
National and Group Deviations)

IEC 62368-1:2014, 2<sup>nd</sup> Edition  
IEC 60601-1:2005/A1:2012



TUV SUD America

EN 62368-1:2014, 2<sup>nd</sup> Edition  
EN 60601-1:2006/A1:2013



Low Voltage Directive  
RoHS Directive (Recast)

(2014/35/EU of February 2014)  
(2015/863/EU of March 2015)



Electrical Equipment (Safety) Regulations 2016 SI No. 1101  
Restriction of the Use of Certain Hazardous Substances in EEE Regulations  
2012 SI No. 3032 + 2019 SI No.492

### MODEL LISTING

MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
GRN-200-4001	+3.3V/30A	+5V/8A	+12V/2A	-12V/2A
GRN-200-4002	+5V/30A	+3.3V/8A	+12V/2A	-12V/2A
GRN-200-4003	+5V/30A	+24V/3A	+12V/2A	-12V/2A
GRN-200-4004	+5V/30A	+24V/3A	+15V/2A	-15V/2A
GRN-200-4005	+24V/6A	+5V/8A	+12V/2A	-12V/2A
GRN-200-3001	+5V/30A	+12V/6A		-12V/2A
GRN-200-3002	+5V/30A	+15V/5A		-15V/2A
GRN-200-3003	+5V/30A		+24V/1.5A	-24V/1.5A
GRN-200-2001	+5V/30A	+24V/3A		
GRN-200-2002	+5V/30A	+12V/6A		
GRN-200-2003	+12V/12A	-12V/6A		
GRN-200-2004	+15V/10A	-15V/5A		

### ORDERING INFORMATION

Consult factory for alternate output configurations.

Please specify the following optional features when ordering:

CH - Chassis  
CO - Cover  
BF - Type BF

PF - Power Fail Warning  
IO - Isolated Outputs

All specifications are maximum at 25°C, 200W unless otherwise stated, may vary by model and are subject to change without notice.

# GRN-200

## OUTPUT SPECIFICATIONS

Output Power at 50°C <sub>(1)</sub>	135W	Convection Cooled, Open Frame
(See Derating Chart)	200W	300LFM Forced Air, Open Frame <sub>(14)</sub>
Voltage Centering <sub>(15)</sub>	Output 1:	± 0.5% (all outputs at 50% load)
	Outputs 2-4:	± 5.0% (all outputs at 50% load)
Voltage Adjust Range	Output 1:	95-105%
Load Regulation	Output 1:	± 0.5% (0-100% load change)
	Outputs 2:	± 6% (4001-4002 20-100% load change)
	Outputs 2-4:	± 5.0% (10-100% load change)
Source Regulation	Outputs 1-4:	0.5%
Cross Regulation	Outputs 2-4:	5.0%
Ripple & Noise <sub>(6)</sub>	Outputs 1-4:	1.0% or 100mV p-p, 20MHz BW
Turn on Overshoot	None	
Transient Response	Output recovers to within 1% of initial set point due to a 50-100-50% step load change, 500µs maximum, 4% maximum deviation.	
Overvoltage Protection	Latching, between 110% and 150% of rated output voltage.	
Overpower Protection	110-150% rated P <sub>OUT</sub> , cycle on/off, auto recovery	
Hold Up Time	16ms minimum, full power	
Start Up Time	<1 sec., 115/230V Input	
Output Rise Time	25ms typical	
Minimum Load <sub>(5)</sub>	No minimum load required	

## INPUT SPECIFICATIONS

Protection Class	I	
Source Voltage	85 – 264 Volts AC (see derating chart)	
Frequency Range	47 – 63 Hz	
Input Protection	Dual internal 5A time delay fuses, 1500A breaking capacity	
Peak Inrush Current	40A max	
Peak Efficiency	Up to 90%	
Average Efficiency	86% (Avg. of 25%, 50%, 75%, 100% rated load)	
No Load Input Power	<300mW, 115/230 V <sub>IN</sub> , no load	
	<500mW, 115/230 V <sub>IN</sub> , no load (PF Option)	

## ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temp. Range	-20°C to +70°C, Derating (see derating Chart)	
Ambient Storage Temp. Range	-40°C to +85°C	
Operating Relative Humidity Range	20-90% non-condensing	
Altitude	3,000m ASL Operating	
Temperature Coefficient	0.02%/°C	
Vibration (MIL-STD-810G)	2.5G swept sine, 10-2000Hz, 1octave/min, 3 axis, 1 hour each	
Shock (MIL-STD-810G)	20G, 11ms, 3 axis	

## GENERAL SPECIFICATIONS

Means of Protection	Primary to Secondary: 2MOPP (Means of Patient Protection)	
	Primary to Ground: 1MOPP (Means of Patient Protection)	
	Secondary to Ground: Operational Insulation (1MOPP w/ Option BF)	
Dielectric Strength <sub>(7, 8)</sub>	Reinforced Insulation: 5656 VDC (4000VAC)	
	Basic Insulation: 2121 VDC (1500VAC)	
	Operational Insulation: 707 VDC (500VAC)/2121VDC(1500VAC) w/ Option BF	
Leakage Current	Earth Leakage: <300µA NC, <1000µA SFC	
	Touch Current: <100µA NC, <500µA SFC	
	Patient Leakage Current: <100µA NC, <500µA SFC w/Option BF	
Power Fail Signal	Logic low with input power failure 9ms prior to loss of Output 1 <sub>(13)</sub>	
Switching Frequency	PWM:65 KHz/PFC:Variable	
Remote Sense <sub>(9)</sub>	250mV compensation of output cable losses (output 1)	
Mean-Time Between Failures	>200,000 HOURS, MIL-HDBK-217F, 25° C, GB	
Weight	1.0 lb. Open frame / 1.16 lb. Chassis and cover	

## EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4<sup>TH</sup> ed./IEC 61000-6-2:2005)

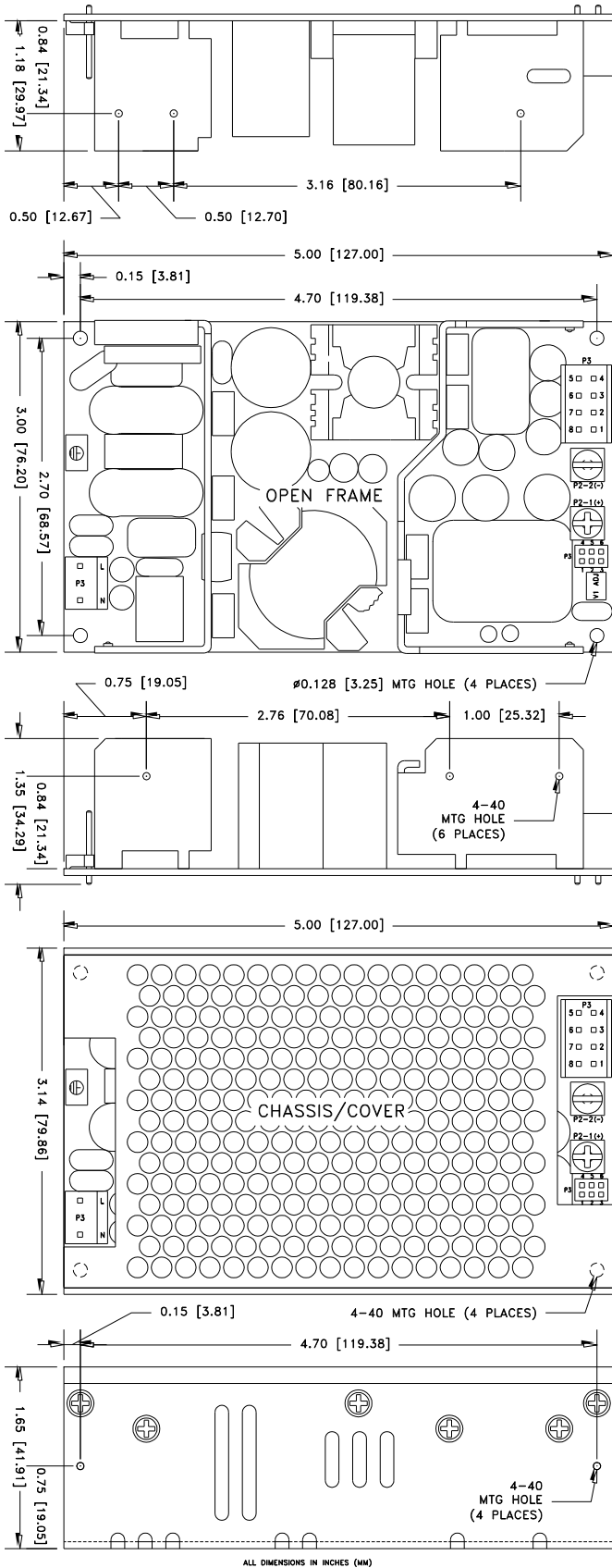
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge	A
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM	A
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz	A
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to line	A
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM	A
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U <sub>T</sub> , 0.5 cycles, 0-315°	100/240V A/A
		0% U <sub>T</sub> , 1 cycles, 0°	100/240V A/A
		40% U <sub>T</sub> , 10/12 cycles, 0°	100/240V B/A
		70% U <sub>T</sub> , 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U <sub>T</sub> , 300 cycles, 0°	100/240V B/B
Radiated Emissions	EN 55011/32	Class B	
Conducted Emissions	EN 55011/32	Class B	
Harmonic Current Emissions	EN 61000-3-2	Class A	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	



INTEGRATED  
POWER DESIGNS

300 Stewart Road ■ Wilkes-Barre, PA 18706 ■ Phone: (570) 824-4666 ■ Fax: (570) 824-4843 ■ Email: sales@ipdpower.com ■ Web: www.ipdpower.com

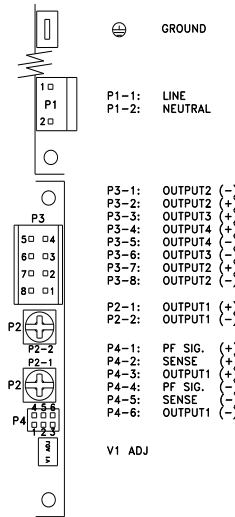
## GRN-200 SERIES MECHANICAL SPECIFICATIONS



### DERATING REQUIREMENTS

- Derate Output 1 (3.3-5V) current rating 33% when convection cooled.
- Derate Outputs 2-4 (12-24V) current rating 25% when convection cooled.
- Derate Total Output Power linearly from 100% load at 50°C to 50% load at 70°C.
- Derate Total Output Power linearly from 100% load at 90V<sub>IN</sub> to 90% load at 85V<sub>IN</sub>.
- Derate Total Output Power 10% when convection cooled using Chassis or Chassis/Cover.
- Derate Total Output Power 10% when forced-air cooled using Chassis or Chassis/Cover.

## CONNECTOR SPECIFICATIONS



**Ground:** 0.187 quick disconnect terminal.

**P1:** 0.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.

**P3:** 5566 Mini-Fit Jr. header mates with 5557 Mini-Fit Jr. or equivalent crimp housing with 5556 Mini-Fit or equivalent crimp terminal.

**P2:** 6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb Max)

**P4:** 0.100 friction lock header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.

## APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 200W, as determined by the cooling method.
- Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
- Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
- This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
- Minimum load is not required for reliable operation; however, a 10% load may be required on Output 1 when loading Outputs 2, 3 or 4.
- Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20MHz bandwidth.
- This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1<sup>st</sup> Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
- This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
- Remote-Sense terminals may be used to compensate for cable losses up to 400mV, depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
- Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
- To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
- Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
- Power Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 9-15ms prior to loss of output from AC failure.
- 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
- A 3% increase above nominal voltage of Output 1 is required to meet ±5% centering of Output 2 on 4002 only.

## MAX P<sub>OUT</sub> vs. AMBIENT TEMPERATURE/INPUT VOLTAGE

