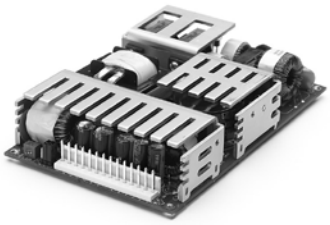
150 WATTS

REL-150 SERIES AC-DC

FEATURES:

- **RoHS Compliant**
- **Universal 85-264 VAC Input**
- **High Efficiency**
- **Advanced SMT Design**
- **Compact 4.2" x 7.0" x 1.5" Size**
- **2 Year Warranty**
- **Fits 1U Applications**
- **EN 60950-1 ITE Certification**
- **EN 60601-1 Medical Certification**
- **Class B Emissions per EN 55011/22**
- **Harmonic Current per EN 61000-3-2**
- **EMC to EN 61000-6-2 & EN 60601-1-2**
- **Optional Chassis and Cover**
- **One to Four Outputs**



OPEN FRAME

CHASSIS/COVER

SAFETY SPECIFICATIONS

General		Protection Class: I Overvoltage Category: II Pollution Degree: 2
c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1 2nd Edition, 2007 UL 60601-1 1st Edition, 2006 AAMI/ANSI ES 60601-1, 2005
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A1:2009, Second Edition IEC 60601-1:1988 +A1:1991 +A2:1995 IEC 60601-1:2005 Third Edition
c UL us	UL Recognition Mark for Canada File E137708/E140259	CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition CAN/CSA-C22.2 No. 601-1-M90, 2005 CAN/CSA-C22.2 No. 60601-1:2008
TUV SUD	TUV	EN 60950-1/A12:2011 EN 60601-1/A2:1995 EN 60601-1:2006
CE	Low Voltage Directive RoHS Directive (Recast)	(2006/95/EC of December 2006) (2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1(6)	OUTPUT 2(6)	OUTPUT 3(5)	OUTPUT 4(5)
REL-150-4001	+3.3V/15A(1)	+5V/8A	+12V/2A	-12V/2A
REL-150-4002	+5V/15A(1)	+3.3V/8A	+12V/2A	-12V/2A
REL-150-4003	+5V/15A(1)	+3.3V/8A	+15V/2A	-15V/2A
REL-150-4004	+5V/15A(1)	-5V/8A	+12V/2A	-12V/2A
REL-150-4005	+5V/15A(1)	-5V/8A	+15V/2A	-15V/2A
REL-150-4006	+5V/15A(1)	+24V/3A	+12V/2A	-12V/2A
REL-150-4007	+5V/15A(1)	+24V/3A	+15V/2A	-15V/2A
REL-150-4009	+24V/2.3A	+10V/1A	+6V/1.6A	-6V/.31A
REL-150-4010	5V/15A(1)	12V/5A	24V/1A	24V/1A
REL-150-3001	+5V/15A(1)	+12V/4A		-12V/3A
REL-150-3002	+5V/15A(1)	+15V/3A		-15V/2A
REL-150-3003	+22V/3.5A	-22V/3.5A	+24V/1A	
REL-150-3004	+5V/6A	+12V/7A		-12V/3A
REL-150-3005	+5.5V/15A(1)	+15.5V/3A		-15.5V/2A
REL-150-2001	+3.3V/15A(1)	+5V/8A		
REL-150-2002	+5V/15A(1)	+12V/5A		
REL-150-2003	+5V/15A(1)	+24V/3A		
REL-150-2004	+12V/7.5A	-12V/5A		
REL-150-2005	+15V/5A	-15V/5A		
REL-150-1001	2.5V/30A(2)			
REL-150-1002	3.3V/30A(2)			
REL-150-1003	5V/30A(2)			
REL-150-1004	12V/12.5A			
REL-150-1005	15V/10.0A			
REL-150-1006	24V/6.3A			
REL-150-1007	28V/5.4A			
REL-150-1008	48V/3.1A			
REL-150-1009	20-31V/5.4A			
REL-150-1010	36V/4.16A			

OUTPUT SPECIFICATIONS

Total Output Power at 50°C	100W 150W	Convection Cooled 300 LFM Forced Air	
Output Voltage Centering	Output 1: Output 2: Output 3: Output 4:	± 0.5% ± 5.0% ± 5.0% ± 5.0%	(All outputs at 50% load)
Output Voltage Adjust Range	Output 1:	95-105%	
Load Regulation	Output 1: Output 2: (4001-5 Models) (2001 Model) Output 3: Output 4:	0.5% 5.0% 8.0% 6.0% 5.0% 5.0%	(10-100% load change) (10-100% load change) (20-100% load change) (20-100% load change) (10-100% load change) (10-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%	
Cross Regulation	Outputs 2 – 4:	5.0%	
Output Noise	Outputs 1 – 4:	1.0%	
Turn on Overshoot	None		
Transient Response Voltage Deviation Recovery Time Load Change	Outputs 1 – 4 5.0% 500µS 50% to 100%		
Output Overvoltage Protection	Output 1:	110% to 150%	
Output Overpower Protection	110-160% rated Pout, cycle on/off, auto recovery		
Hold Up Time	16 mS min., Full Power, 85V Input		
Start Up Time	5 Seconds, 120V Input		

INPUT SPECIFICATIONS

Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Peak Inrush Current	40A
Efficiency	82% Typ., Full Power, 230V, varies by model
Power Factor	0.95 (Full Power, 230V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0° C to + 70° C Derating: See Power Rating Chart
Ambient Storage Temp. Range	- 40° C to + 85° C
Temperature Coefficient	Outputs 1 – 4: 0.02%/°C

GENERAL SPECIFICATIONS

Means of Protection Primary to Secondary Primary to Ground Secondary to Ground	 2MOPP (Means of Patient Protection) 1MOPP (Means of Patient Protection) Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(15) Reinforced Insulation Basic Insulation Operational Insulation	 5656 VDC, Primary to Secondary, 1 Sec. 2545 VDC, Primary to Ground, 1 Sec. 707 VDC, Secondary to Ground, 1 Sec.
Leakage Current	<300uA NC, <1000uA SFC <100uA NC, <500uA SFC
Power Fail Signal	Logic low with input power failure 10 mS minimum prior to Output 1 dropping 1%
Remote On/Off (optional)	Contact closure shuts off all outputs
Remote Sense	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	1.15 Lbs. Open Frame/ 1.82 Lbs. Chassis and Cover

ELECTROMAGNETIC COMPATIBILITY SPECIFICATIONS

Electrostatic Discharge	EN 61000-4-2	±8kV Contact/ ± 8kV Air Discharge
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.5GHz, 10/m, 80% AM
EFT/Bursts	EN 61000-4-4	±2 kV
Surges	EN 61000-4-5	± 1 kV Common/ ± 2 kV Differential Mode
Conducted Immunity	EN 61000-4-6	.15 to 80MHz, 10V, 80% AM
Voltage Dips and Interruptions	EN 61000-4-11	30% Reduction, 500ms 95% Reduction, 10ms 60% Reduction, 1s (Criteria B) 95% Reductions, 5000ms
Voltage Interruptions	EN 61000-4-11	95% Reduction, 5s
Radiated Emissions	EN 55011/22	Class B
Conducted Emissions	EN 55011/22	Class B
Harmonic Current Emissions	EN 61000-3-2	
Voltage Fluctuations and Flicker	EN 61000-3-3	

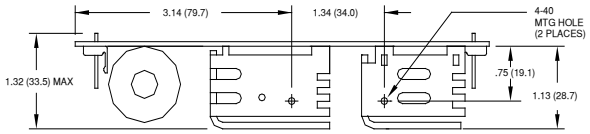
NOTES

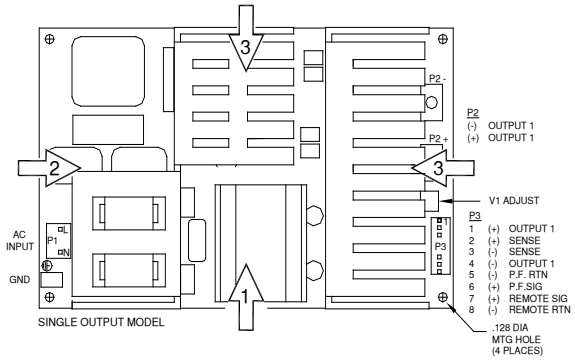
Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Refer to Applications Information for complete output power ratings.
All specifications are maximum at 25° C, 150W unless otherwise stated, may vary by model and are subject to change without notice.
Specify optional chassis and cover or remote on/off when ordering.
TUV only: REL-110-4010

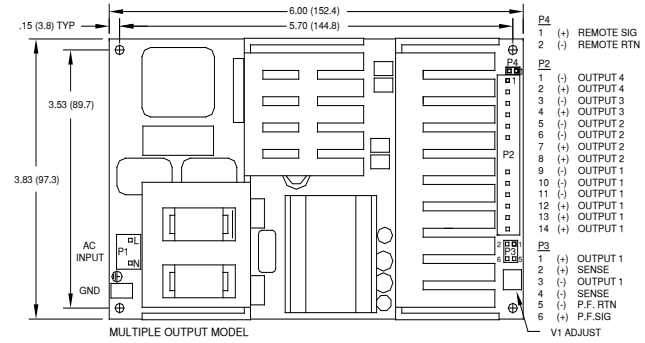
INTEGRATED POWER DESIGNS 300 Stewart Road ■ Wilkes-Barre, PA 18706 ■ Phone: (570) 824-4666 ■ Fax: (570) 824-4843 ■ Email: sales@ipdpower.com ■ Web: www.ipdpower.com

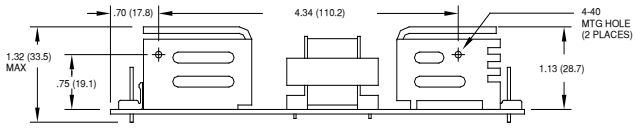
REL-150 SERIES MECHANICAL SPECIFICATIONS

OPEN FRAME

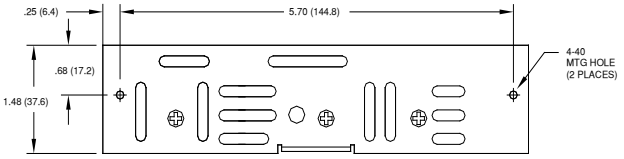


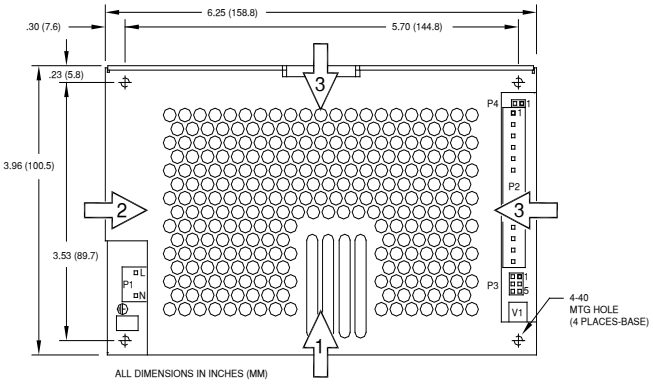






OPTIONAL CHASSIS/COVER





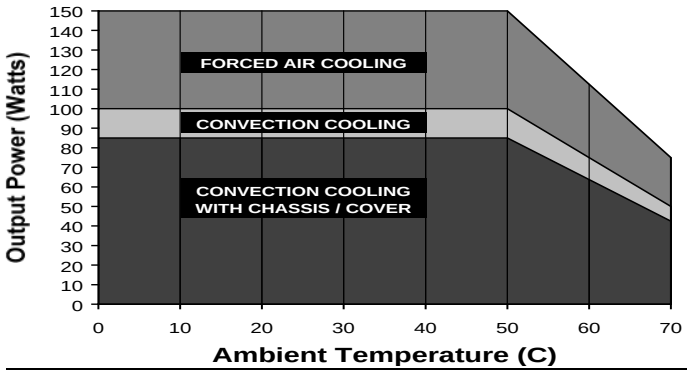
RECOMMENDED AIR FLOW DIRECTION

1 – Optimum 2 – Good 3 – Fair

APPLICATIONS INFORMATION

1. Rated 12A maximum with convection cooling.
2. Rated 20A maximum with convection cooling.
3. Total power must not exceed 100 watts with convection cooling or 150 watts with 300 LFM forced air cooling on open frame models except where noted.
4. Total power must not exceed 85 watts with convection cooling or 150 watts with 300 LFM forced air cooling and chassis/cover option.
5. Total current from Outputs 3 & 4 must not exceed 3 amps with convection cooling.
6. Total current from Outputs 1 & 2 must not exceed 15 amps with convection cooling.
7. Semiconductor case temperatures must not exceed 110°C.
8. Each output can deliver its rated current but total output power must not exceed maximum power as determined by the cooling method stated above.
9. Sufficient area must be provided around convection cooled power supplies to allow natural movement of air to develop.
10. 300 linear feet per minute of airflow must be maintained one inch above any point of the heatsink in the direction shown when forced air cooling is required.
11. This product is intended for use as a professionally installed component within information technology and medical equipment.
12. A minimum load of 10% is required on output one to ensure proper regulation of remaining outputs.
13. Remote sense terminals may be used to compensate for cable losses up to 250mV. The use of a twisted pair is recommended as well as a decoupling capacitor (0.1 - 10μF) and a capacitor of 100μF/amp connected across the load side.
14. 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, 20 MHz bandwidth.
15. 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 insure 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 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
16. 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.
17. Maximum screw penetration into bottom chassis mounting holes is .100 inches.
18. Maximum screw penetration into side chassis mounting holes is .250 inches.
19. To meet emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/cover option recommended.
20. This product includes only one fuse in the input circuit. In consideration of Clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in the end product.

MAXIMUM OUTPUT POWER VS. AMBIENT TEMPERATURE



CONNECTOR SPECIFICATIONS

P1	AC Input	.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
P2	DC Output (Single)	6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb max)
P2	DC Output (Multiple)	.156 friction lock header mates with Molex 09-50-3141 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
G	Ground	.187 quick disconnect terminal.
P3	Remote/P.F./ Sense (Single)	.100 friction lock header mates with Molex 50-57-9008 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
P3	P.F./Sense (Multiple)	.100 breakaway header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex type 70058 or equivalent crimp terminal.
P4	Remote (Multiple)	.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.

REV.H 07/08/2013