

# 110 WATTS

## REL-110 SERIES

## OUTPUT SPECIFICATIONS

### Features

- Universal 85-264 VAC Input
- High Efficiency
- Advanced SMT Design
- Compact 3.0" X 5.0" X 1.3" Size
- 2 Year Warranty
- Fits 1U Application
- One to Four Outputs
- EN 60950 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 & Cover



OPEN FRAME



CHASSIS/COVER

Total Output Power	80 W Convection Cooled 110 W 300 LMF Forced Air
Output Voltage Centering(50% Load)	Output 1: +/-0.5% Output 2: +/-5.0% Output 3: +/-5.0% Output 4: +/-5.0% (All outputs at 50% rated load)
Source Regulation	Outputs 1-4: 0.5%
Load Regulation	Output 1:0.5% (10-100% Load Change) Output 2: 5.0% (20-100% Load Change) (4001-5) 8.0% (20-100% Load Change) (2001) 8.0% (20-100% Load Change) Output 3: 5.0% (20-100% Load Change) Output 4: 5.0% (20-100% Load Change)
Cross Regulation	Output 2-4: 5.0%
Output Voltage Adjust Range	Output 1: 95%-105%
Output Noise	Outputs 1-4: 1%
Turn On Overshoot	None
Transient Response	Outputs 1-4:
Voltage Deviation	5%
Recovery Time	500 $\hat{A}$ $\mu$ S
Load Change	50% To 100%
Output Overvoltage Protection (Optional)	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 85 V Input
Start Up Time	4 Second, 120V Input

## INPUT SPECIFICATIONS

Source Voltage	85-264 Voltage 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

ELECTROMAGNETIC COMPATIBILITY			GENERAL SPECIFICATIONS	
Electrostatic Discharge	EN 61000-4-2	+/-8kV Contact Discharge +/-8kVAir Discharge	Dielectric Strength	Reinforced Insulation5656 VDC, Primary to Secondary, 1 Sec.
Radiated Electro-magnetic Field	EN 61000-4-3	80MHz-2.5GHz, 10V/m, 80% AM	Operational Insulation	Basic Insulation2121 VDC, Primary to Ground, 1 Sec.
EFT/Bursts	EN 61000-4-4	+/-2kV	Leakage Current	500 VDC, Secondary to Ground, 1 Sec.
Surges	EN 61000-4-5	+/-1 kV Differential Mode +/-2 kV Common Mode	Power Fail Signal	<300 ÅµA Earth Leakage Current
Conducted Immunity	EN 61000-4-6	.15-80MHz., 10V, 80% AM	Remote Sense(singles only)	Logic low with input power failure 10mS minimum prior to output 1 dropping 1%
Voltage Dips and Interruptions	EN 61000-4-11	30% Reduction 95% Reduction 60% Reduction 95% Reduction	Mean Time Between Failures	250mV compensation of output cable losses
Radiated Emissions	EN 55011/22	Class B	Weight	100,000 Hours min., MIL-HDBK-217F, 25°C, GB
Conducted Emissions	EN 55011/22	Class B		0.80 Lbs. Open Frame 1.28 Lbs. Chassis and Cover
Harmonic Current Emissions	EN 61000-3-2			
Voltage Fluctuations and Flicker	EN 61000-3-3			

### MODEL LISTING

Model	Output 1	Output 2	Output 3	Output 4
REL-110-4001	+3.3V/10A <sub>(1)</sub>	+5V/6A	+12V/2A	-12V/2A
REL-110-4002	+5V/10A <sub>(1)</sub>	+3.3V/6A	+12V/2A	-12V/2A
REL-110-4003	+5V/10A <sub>(1)</sub>	+3.3V/6A	+15V/2A	-15V/2A
REL-110-4004	+5V/10A <sub>(1)</sub>	-5V/6A	+12V/2A	-12V/2A
REL-110-4005	+5V/10A <sub>(1)</sub>	-5V/6A	+15V/2A	-15V/2A
REL-110-4006	+5V/10A <sub>(1)</sub>	+24V/2A	+12V/2A	-12V/2A
REL-110-4007	+5V/10A <sub>(1)</sub>	+24V/2A	+15V/2A	-15V/2A
REL-110-4009	+5V/10A <sub>(1)</sub>	+24V/2A	+7V/2.5A	-7V/2.5A
REL-110-3001	+5V/10A <sub>(1)</sub>	+12V/3A		-12V/3A
REL-110-3002	+5V/10A <sub>(1)</sub>	+15V/2A		-15V/2A
REL-110-3003	+8V/6A <sub>(1)</sub>	-8V/1A		+30V/1A
REL-110-3004	+9V/3A <sub>(1)</sub>	+24V/3A	+13V/2A	
REL-110-2001	+3.3V/10A <sub>(1)</sub>	+5V/6A		
REL-110-2002	+5V/10A <sub>(1)</sub>	+12V/5A		
REL-110-2003	+5V/10A <sub>(1)</sub>	+24V/3A		
REL-110-2004	+12V/5A	-12V/5A		
REL-110-2005	+15V/4A	-15V/3A		
REL-110-2006	+18V/4A	-18V/3A		
REL-110-1001	2.5V/22A <sub>(2)</sub>			
REL-110-1002	3.3V/22A <sub>(1)</sub>			
REL-110-1003	5V/22A <sub>(1)</sub>			
REL-110-1004	12V/9.2A			
REL-110-1005	15V/7.3A			
REL-110-1006	24V/4.6A			
REL-110-1007	28V/3.9A			
REL-110-1008	48V/2.3A			

## Notes

Consult factory for alternate output configuration.





Consult factory for positive, negative or floating output 2 or 3.

Refer to Application Information for complete output power ratings.

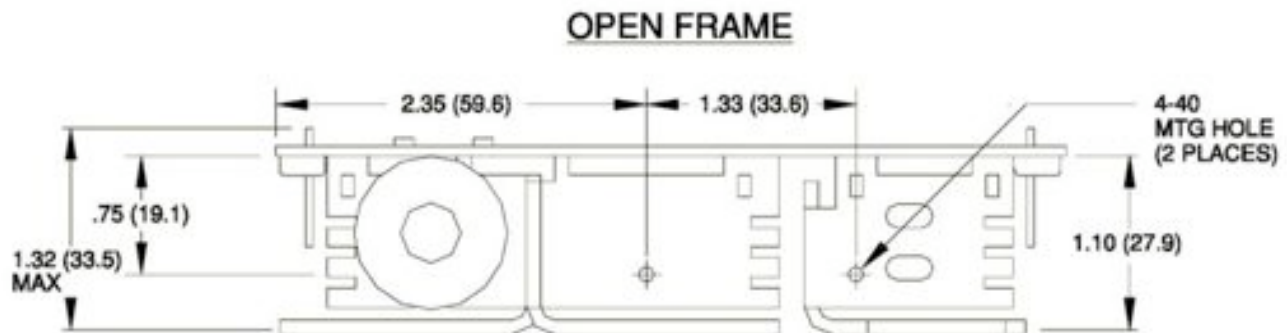
All specifications are maximum at 25°C unless otherwise stated and are subjected to change without notice.

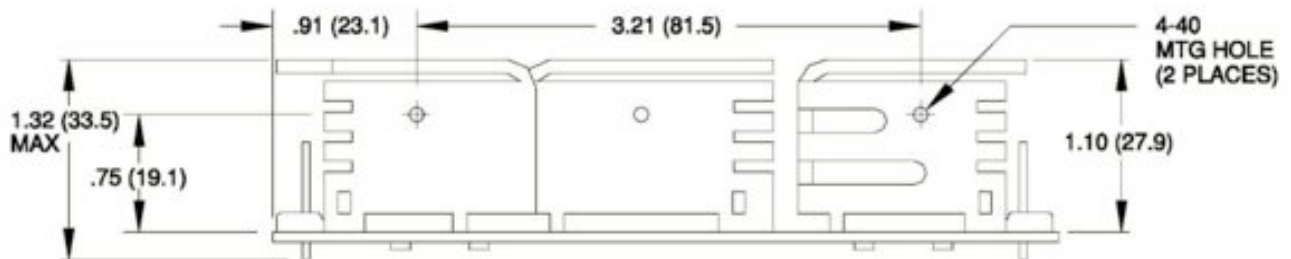
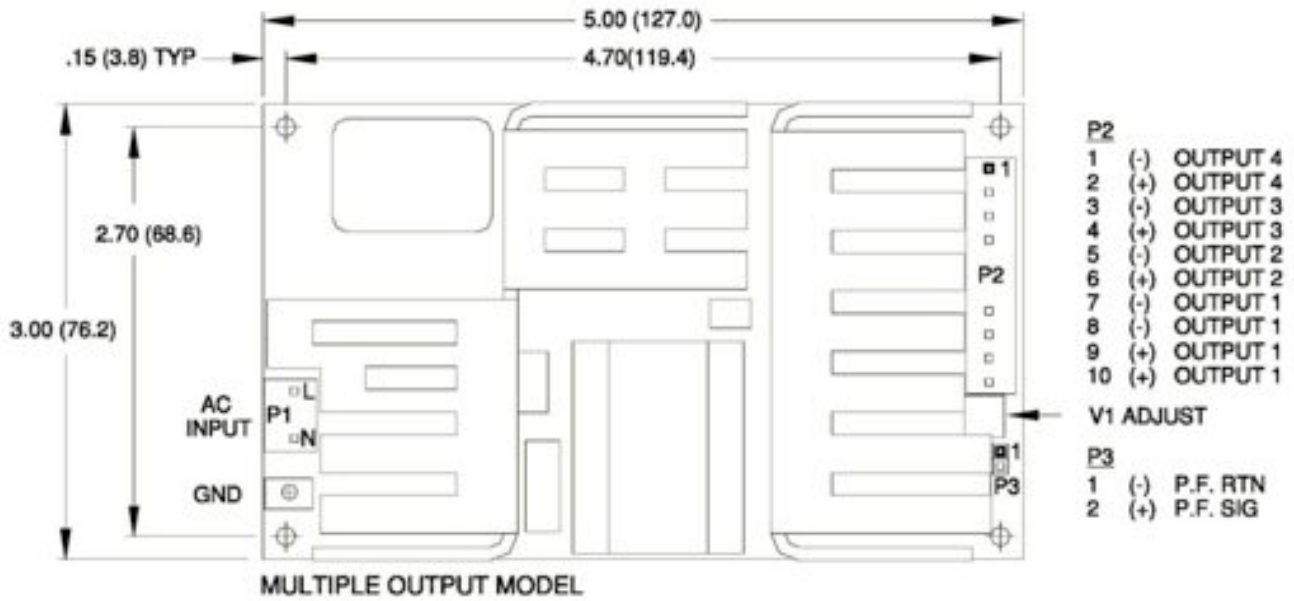
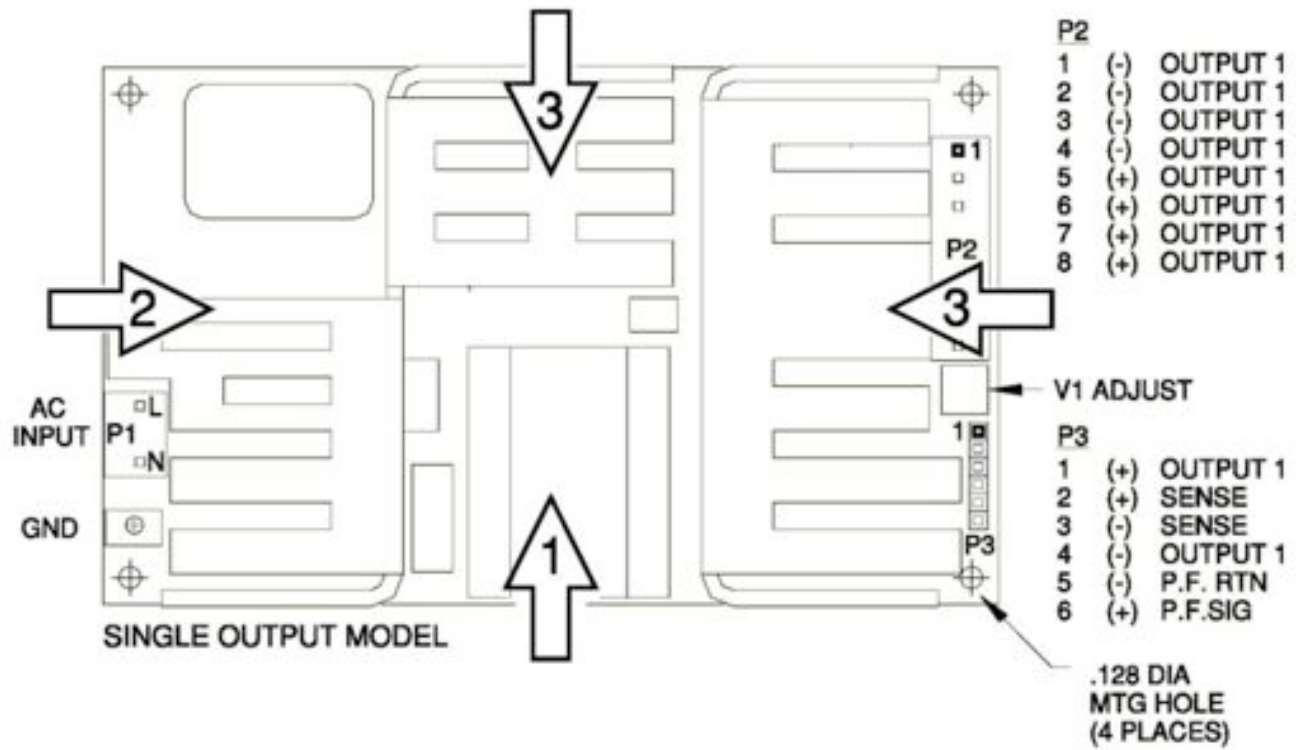
Specify optional chassis and cover when ordering.

## SAFETY SPECIFICATIONS

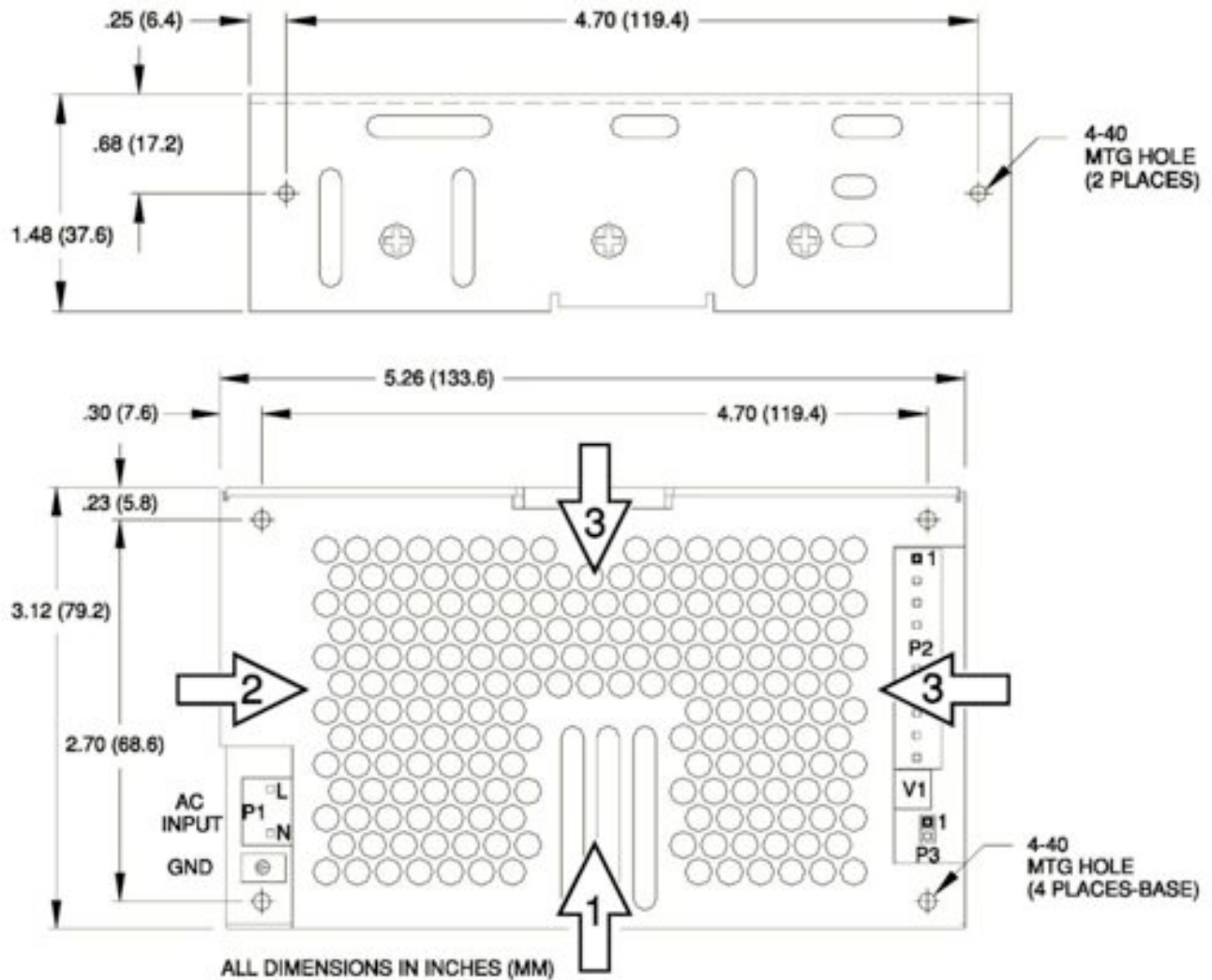
General	Protection Class:	I
	Overtoltage Category:	II
	Pollution Degree:	2
 Underwriters Laboratories File E137708	UL 60950, Third Edition UL 2601 - 1 Second Edition CB Report Per IEC 60950 (1999) Second Edition A1, A2, A3, A4 All EN 60950 Deviations CB Report Per IEC 60601-1-1988 Second Edition, A1, A2	
 UL Recognition Mark for Canada File E137708	CAN/CSA-C22.2 No. 60950:00 CAN/CSA-C22.2 No. 601-1-M90	
 TUV	EN 60950/2000 EN 60601-1/A2: 1995	
	Low Voltage Directive	

## REL-110 SERIES MECHANICAL SPECIFICATIONS





## OPTIONAL CHASSIS/COVER



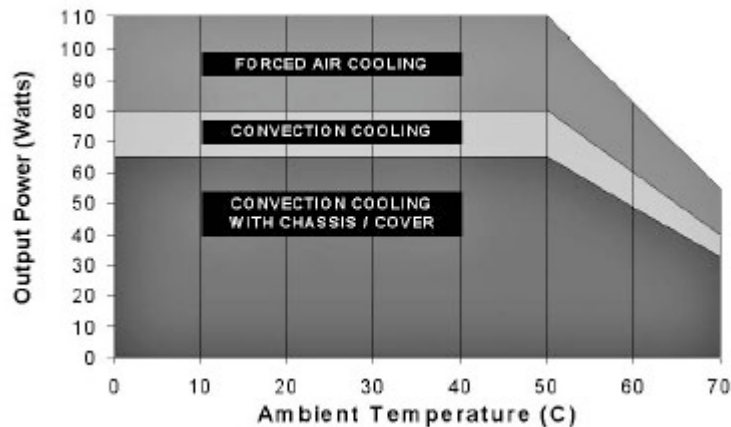
### APPLICATIONS INFORMATION

1. Rated 8A with convection cooling.
2. Rated 16A with convection cooling.
3. Total power must not exceed 50 watts with convection cooling on open frame models.
4. Total power must not exceed 70 watts with 300LFM forced air cooling on open frame models.
5. Total power must not exceed 40 watts with convection cooling and chassis/cover option.
6. Total power must not exceed 70 watts with 300LFM forced air cooling and chassis/cover option.
7. Total current from Outputs 3 & 4 must not exceed 3 amps with convection cooling.
8. Total current from Outputs 1 & 2 must not exceed 12 amps with convection cooling.
9. Semiconductor case temperature must not exceed 110° C.
10. Each output can deliver its rated current but total output power must not exceed maximum power as determined by the cooling method state above.
11. Sufficient area must be provided around convection cooled power supplies to allow natural movement of air develop.
12. 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.
13. This product is intended for use as a professionally installed component within information technology and medical equipment.
14. 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 0 10µF) and a capacitor of

100 $\mu$ F/amp connected across the load.

15. 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.
16. This product was type tested and safety certificated using the the dielectric strength test voltages listed in Table V of UL 60601-1. In consideration of clause 20.4g, care must be taken to insure the voltage applied to a reinforced insulation does not over stress basic insulation. Secondary to ground capacitors may need to be removed prior to performing a dielectric strength type test on the end product. It is highly recommended that the DC test voltages listed in DVB.1. Annex DVB are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
17. A minimum load of 10% is required on output one to insure proper regulation of remaining outputs.
18. This power supply has been safety approved and final tested using a DC dielectric strength test. Please consult factory before performing AC dielectric strength test.
19. Maximum screw penetration into bottom chassis mounting holes is .100 inches.
20. Maximum screw penetration into side chassis mounting holes is .188 inches.
21. To meet emissions specifications, all four mounting hole ground pads must be electrically connected to a common metal chassis. Chassis/cover option recommended.
22. This product is use only one fuse in the input circuit. In consideration of clause 57.6 of UL 2601-1, 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)	.156 friction lock header mates with Molex 09-50-3081 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
P2 DC Output(Multiple)	.156 friction lock header mates with Molex 09-50-3101 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
G Ground	.187 quick disconnect terminal.
P3 P.F./Sense(Single)	.100 friction lock header mates with Molex 50-57-9006 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
p3 P.F./Sense(Multiple)	.100 friction lock header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.

## RECOMMENDED AIR FLOW DIRECTION

1.Optimum 2.Good 3.Fair