

185 WATTS

SINGLE/MULTI OUTPUT AC-DC

FEATURES:






- Compact 4.2" x 7.0" x 1.5" Size
- 2 Year Warranty
- Universal 85-264V Input
- One to Four Outputs
- High Efficiency
- 0-70°C Operating Temperature
- IEC 60601-1 3rd ed. Medical Cert.
- IEC 60950-1 2nd ed. ITE Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN55011/32
- RoHS Compliant
- Optional Remote Inhibit/Enable
- Optional Chassis/Cover



CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2 nd Edition IEC 60601-1:2005/A1:2012
	UL Recognition Mark for Canada File E137708/E140259	CAN/CSA-C22.2 No. 60950-1-07, 2 nd Edition CAN/CSA-C22.2 No. 60601-1:2014
	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

MODEL NO.	OUTPUT 1 ⁽²¹⁾	OUTPUT 2 ⁽²¹⁾	OUTPUT 3 ⁽²⁰⁾	OUTPUT 4 ⁽²⁰⁾
REL-185-4001	+3.3V/20A ⁽²²⁾	+5V/10A	+12V/2A	-12V/2A
REL-185-4002	+5V/20A ⁽²²⁾	+3.3V/10A	+12V/2A	-12V/2A
REL-185-4003	+5V/20A ⁽²²⁾	+3.3V/10A	+15V/2A	-15V/2A
REL-185-4004	+5V/20A ⁽²²⁾	-5V/10A	+12V/2A	-12V/2A
REL-185-4005	+5V/20A ⁽²²⁾	-5V/10A	+15V/2A	-15V/2A
REL-185-4006	+5V/20A ⁽²²⁾	+24V/3A	+12V/2A	-12V/2A
REL-185-4007	+5V/20A ⁽²²⁾	+24V/3A	+15V/2A	-15V/2A
REL-185-3001	+5V/20A ⁽²²⁾	+12V/5A		-12V/3A
REL-185-3002	+5V/20A ⁽²²⁾	+15V/4A		-15V/3A
REL-185-2001	+3.3V/20A ⁽²²⁾	+5V/10A		
REL-185-2002	+5V/20A ⁽²²⁾	+12V/8A		
REL-185-2003	+5V/20A ⁽²²⁾	+24V/4A		
REL-185-2004	+12V/10A	-12V/6A		
REL-185-2005	+15V/8A	-15V/5A		
REL-185-2006	+15V/6A	+24V/4A		
REL-185-2007	+35V/3.5A	+12V/5.2A		
REL-185-1001	2.5V/37A ⁽²³⁾			
REL-185-1002	3.3V/37A ⁽²³⁾			
REL-185-1003	5V/37A ⁽²³⁾			
REL-185-1004	12V/15.4A			
REL-185-1005	15V/12.3A			
REL-185-1006	24V/7.7A			
REL-185-1007	28V/6.6A			
REL-185-1008	48V/3.8A			
REL-185-1009	6.3V/29A ⁽²³⁾			

ORDERING INFORMATION

Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:

CH – Chassis
CO – Cover
TS – Terminal Strip
RE – Remote Inhibit
I/O – Isolated Outputs

REL-185

OUTPUT SPECIFICATIONS

Total Output Power at 50°C ₍₁₎ (See Derating Chart)	135W 185W	Convection Cooled ₍₁₆₎₍₁₈₎ Forced-Air Cooled ₍₁₅₎₍₁₇₎₍₁₉₎
Output Voltage Centering	Output 1: Output 2: Output 3: Output 4:	± 0.5% (All outputs at 50% load) ± 5.0% ± 5.0% ± 5.0%
Output Voltage Adjust Range	Output 1:	95 - 105%
Load Regulation	Output 1: Output 2: (4001,4,5, 2001) (4002,4003) Output 3: Output 4:	0.5% (10-100% load change) 5.0% (10-100% load change) 10.0% (20-100% load change) 15.0% (20-100% load change) 5.0% (10-100% load change) 5.0% (10-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%
Cross Regulation	Outputs 2 – 4:	6.0%
Output Noise	Outputs 1 – 4:	1.0%
Turn on Overshoot		None
Transient Response	Outputs 1 – 4	
Voltage Deviation		5.0%
Recovery Time		500µs
Load Change		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		16ms min., Full Power, 85V Input
Start Up Time		5 Seconds, 120V Input

INPUT SPECIFICATIONS

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

ENVIRONMENTAL SPECIFICATIONS

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

GENERAL SPECIFICATIONS

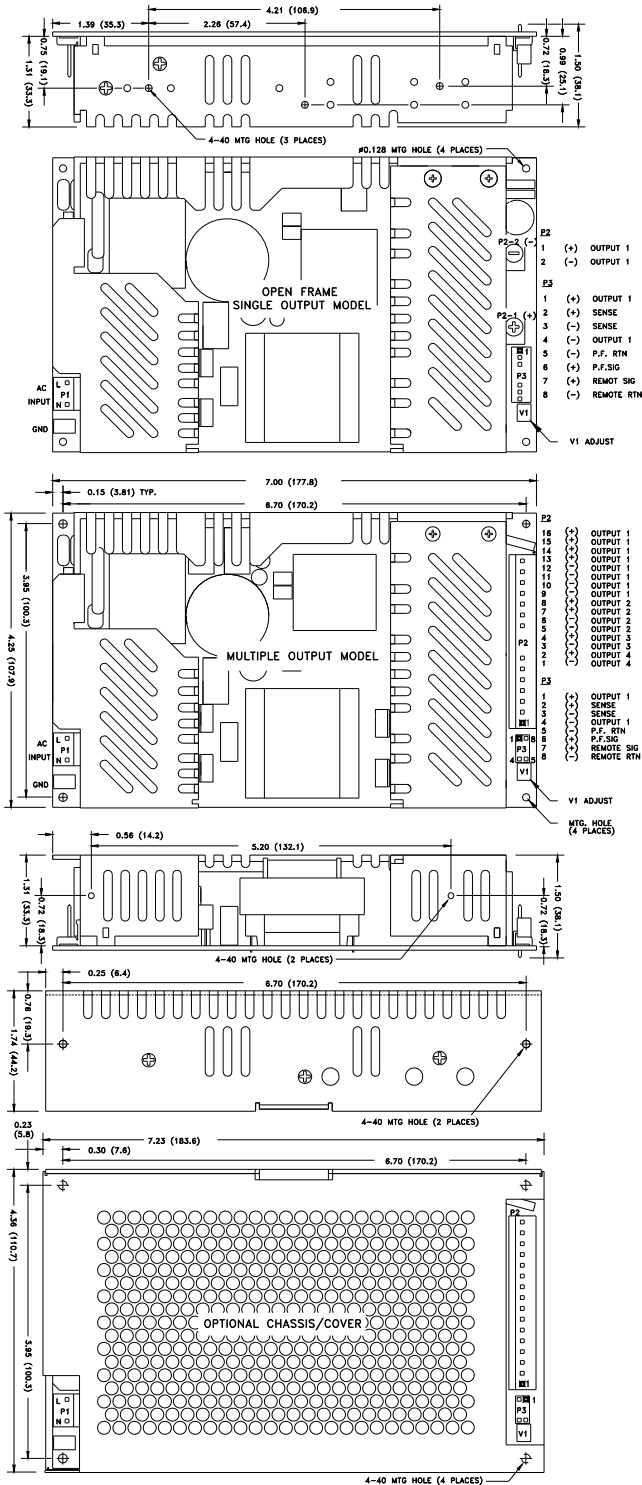
Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOPP (Means of Patient Protection) (1MOOP- Singles)
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength ^(8, 9)	
Reinforced Insulation	5656 VDC, Primary to Secondary
Basic Insulation	2121 VDC, Primary to Ground
Operational Insulation	707 VDC, Secondary to Ground
Leakage Current	
Earth Leakage	<300µA NC, <1000µA SFC
Touch Current	<100µA NC, <500µA SFC
Power Fail Signal ⁽¹⁴⁾	Logic low with input power failure 10 ms minimum prior to Output 1 dropping 1%
Remote Inhibit (optional)	Contact closure inhibits all outputs
Remote Sense ⁽¹⁰⁾	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	1.70 Lbs. Open Frame/ 2.70 Lbs. Chassis and Cover

EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4th 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% Ur, 0.5 cycles, 0-315° 100/240V A/A 0% Ur, 1 cycles, 0° 100/240V A/A 40% Ur, 10/12 cycles, 0° 100/240V B/A 70% Ur, 25/30 cycles, 0° 100/240V B/A	
Voltage Interruptions	EN 61000-4-11	0% Ur, 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	

All specifications are maximum at 25°C/185W unless otherwise stated, may vary by model and are subject to change without notice.

REL-185 SERIES MECHANICAL SPECIFICATIONS

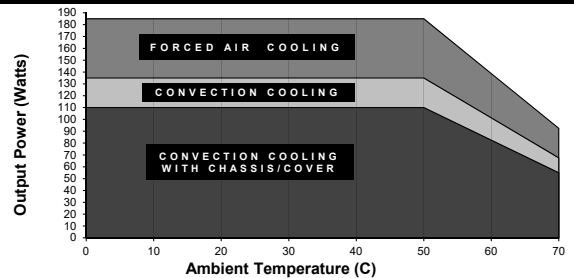


ALL DIMENSIONS IN INCHES (mm)

APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 185W, 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.
- A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
- 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 neutral conductor of the end product.
- 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), 20 MHz 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 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.
- 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 250mV. 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 0.250 inches.
- To comply with emissions specifications, all four mounting hole ground pads must be electrically connected to a common metal chassis. Chassis/Cover option 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 10ms prior to loss of output from AC failure, 5V/10mA.
- 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
- Total power must not exceed 135W with convection cooling on open-frame models except where noted.
- Total power must not exceed 185W with 300LFM forced-air cooling on open-frame models.
- Total power must not exceed 110W with convection cooling and Chassis/Cover option.
- Total power must not exceed 185W with 300LFM forced-air cooling and Chassis/Cover option.
- Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
- Total current from Outputs 1 & 2 must not exceed 20A with convection cooling.
- Rated 15A maximum with convection cooling.
- Rated 27A maximum with convection cooling.

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



CONNECTOR SPECIFICATIONS

P1	AC Input	0.156 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)	0.156 friction lock header mates with Molex 09-50-3161 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	Option/Sense (Single)	0.100 friction lock header mates with Molex 50-57-9008 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
P3	Option/Sense (Multiple)	0.100 breakaway header mates with Molex 22-55-2081 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.

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