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 EMC to EN 61000-6-2 & EN 60601-1-2
- 2 Year Warranty
- Fits 1U Applications



- EN 60601-1 Medical Certification
- Class B Emissions per EN 55011/22
- Harmonic Current per EN 61000-3-2
- Optional Chassis and Cover
- One to Four Outputs





1

OPEN FRAME

SAFETY SPECIFICATIONS

CHASSIS/COVER

Protection Class:

General		Overvoltage Category: II Pollution Degree: 2			
c 911 us	Underwriters Laboratories File E137708/E140259		UL 60950-1 2 nd Edition, 2007 UL 60601-1 1 st Edition, 2006 AAMI/ANSI ES 60601-1, 2005		
IECEE SCHEME			National and G IEC 60950-1/A IEC 60601-1:1 IEC 60601-1:2	ertificates (including all Group Deviations) .1:2009, Second Edition 988 +A1:1991 +A2:1995 005 Third Edition	
c AL us	UL Recognition Mark for Canad File E137708/E	la	2 nd Edition CAN/CSA-C22 CAN/CSA-C22	2.2 No. 60950-1-07, 2.2 No. 601-1-M90, 2005 2.2 No. 60601-1:2008	
TUV	TUV		EN 60950-1/A EN 60601-1/A EN 60601-1:20	2:1995	
CE	Low Voltage Directive RoHS Directive (Recast)		(2006/95/EC of December 2006) (2011/65/EU of June 2011)		
MODEL LIS					
MODEL	OUTPUT 1 ₍₆₎	OUTPUT 2	(=)	(+)	
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 +24V/3A	+15V/2A +12V/2A	-15V/2A -12V/2A	
REL-150-4006 REL-150-4007	+5V/15A ₍₁₎ +5V/15A ₍₁₎	+24V/3A +24V/3A	+15V/2A +15V/2A	-12V/2A -15V/2A	
REL-150-4007	+24V/2.3A	+24V/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	247/1/	-12V/3A	
REL-150-3001	+5V/15A(1)	+15V/3A		-15V/2A	
REL-150-3003	+22V/3.5A	-22V/3.5A	+24V/1A	10 1/2/1	
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 REL-150-1010	20-31V/5.4A 36V/4.16A				

SOUTED S	OUTPUT SPECIFICAT				
Output Voltage Centering Output 1: ± 0.5% (All outputs at 50% load) Output 2: ± 5.0% Output 3: ± 5.0% Output 3: ± 5.0% Output 3: ± 5.0% Output 4: ± 5.0% Output 1: 95.105% (10-100% load change) Output 1: 95.105% (10-100% load change) Output 2: 5.0% (10-100% load change) (2001 Model) 6.0% (20-100% load change) (2001 Model) 6.0% (20-100% load change) Output 3: 5.0% (10-100% load change) Output 3: 5.0% (10-100% load change) Output 4: 5.0% (10-100% load change) Output 5: 5.0% (10-100% load change) Output 5: 4: 5.0% (10-100% load change) Output 5: 5.0% (10-100% load change) Output 5: 5.0% (10-100% load change) Output 5: 5.0% (10-100% load change) Output 6: 5.0% (10-100% load change) Output 5: 5.0% (10-1000% load change) Output 5: 5.0% (10-1000% load change) Output 5: 5.0% (10-1000% lo	Total Output Power at 50°C		Convection Cooled		
Output 2	O. t t V-lt O ti				
Output Voltage Adjust Range	Output voltage Centering		' '		
Output Voltage Adjust Range					
Output Voltage Adjust Range					
Load Regulation	Output Voltage Adjust Range				
Oulpu 12:					
(2001 Model) 6.0% (20-100% load change) Output 3: 5.0% (10-100% load change) Output 4: 5.0% (10-100% load change) Output 4: 5.0% (10-100% load change) Output 5: 5.0% (10-100% load change) Output 6: 5.0% (10-100% load change) Output 7: 5.0% (10-100% load change) Output 7: 5.0% Output 8: 5.0% Output 9: 5.0% Output 5: 5.0% Output 0vervoltage Protection Output 1: 110% to 150% Output 0vervoltage Protection Output 1: 110% to 150% Output 0vervoltage Protection Output 1: 110% to 150% Output 1: 110% Output 9: 5.0% Output 1: 110% Output 9: 5.0% Output 1: 110% Output 9: 5.0%	3				
Output 3: 5.0% (10-100% load change) Source Regulation Outputs 1 - 4: 0.5% Cross Regulation Outputs 1 - 4: 5.0% Output Noise Outputs 1 - 4: 5.0% Turn on Overshoot None Transient Response Outputs 1 - 4: 1.0% Voltage Deviation 5.0% 10.0 Recovery Time 5.0% 15.0% Load Change 500µS 10.0 Load Change 50% to 100% Output Overpower Protection 10-160% 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 9.95 (Full Power, 230V) Environal Derating 0° C to + 70° C Emperature Range 0° C to + 70° C Cemperature Range 0° C to + 70° C					
Output 4:		` ,			
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 Outputs 1 - 4: 1.0% Turn on Overshoot None Transient Response Outputs 1 - 4: 1.0% Recovery Time 5.00µS Load Change 50% to 100% Output Overpower Protection Output 0: 110% to 150% Output Overpower Protection 110-160% rated Pout, cycle on/off, auto recovery Holds Up Time 5 seconds, 120V Input 15 seconds, 120V Input 15 Source Voltage 85 - 264 Volts AC Frequency Range 47 - 63 Hz Frequency Range 47 - 60			` ,		
Cross Regulation Outputs 2 - 4: 5.0% Output Noise Outputs 1 - 4: 1.0% Turn on Overshoot None Transient Response Output 5 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 16 mS min., Full Power, 85V Input Stource Voltage 85 - 264 Volts AC Frequency Range 47 - 63 Hz Peak Inrush Current 40A Efficiency 82% Typ., Full Power, 230V, varies by model Opeak Inrush Current 40A Environ MENTAL SPECIFICATIONS Ambient Operating 0° C to + 70° C Environ MENTAL SPECIFICATIONS Ambient Storage Temp. Range 0° C to + 70° C Temperature Coefficient Operational Insulation GENERAL SPECIFICATIONS Means of Protection Operational Insulation Primary to Ground 25656 VDC, Primary to Scondary, 1 Sec. Package Cu	Source Regulation		(1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
Output Noise Outputs 1 - 4: 1,0% Turn on Overshoot None Transient Response Outputs 1 - 4: 5,0% Voltage Deviation 5,0% Recovery Time 5,0% to 100% Load Change 5,0% to 100% Output Overvoltage Protection Output Overvoltage Protection Hold Up Time 16 mS min., Full Power, 85V Input Start Up Time 5 Seconds, 120V Input INPUT SPECIFICATIONS Source Voltage 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 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 Potection Means of Protection 1MOPP (Means of Patient Protection) Primary to Ground 1MoPP (
Turn on Overshoot					
Voltage Deviation 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 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 0.95 (Full Power, 230V, varies by model 0.95 (Full Power, 230V) ENVIRONMENTAL SPECIFICATIONS Ambient Operating 0° C to + 70° C Derating: See Power Rating Chart 40° C to + 85° C Output 1 - 4: 0.02%/°C GENERAL SPECIFICATIONS Means of Protection Primary to Secondary Derational Insulation (Departional Insulation (Departional Insulation Departional Insulation Consult factory for 1MOPP (Means of Patient Protection) Operational Insulation To 70 VDC, Secondary to Ground, 1 Sec. 1000 A NC, <1000 A SFC Power Fail Signal Control Compensation of Output 1 dropping 1% Contact Closure shuts off all outputs Remote Sense 250mV compensation of output 1 adopting 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 1.5 Lbs. Open Framer 1.82 Lbs. Chassis and Cover ELECTROMAGNETIC COMPATIBILITY SPECIFICATIONS Electrostatic Discharge EN 61000-42 ±8kV Contact/±8kV Air Discharge EN 61000-45 ±1kV Common/±2kV Differential Mode Conducted Immunity EN 61000-4-11 95% Reduction, 500ms 95% Reduction, 15 (Criteria B) 95% Reduction, 5500ms 95% Reduction, 5500ms EN 55011/22 Class B EN 61000-3-2		None			
Recovery Time Load Change So% to 100% Output Overpower Protection Output Overpower Protection Output Overpower Protection 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 Onset Input One Power Factor 20, 75 (Full Power, 230V) ENVIRONMENTAL SPECIFICATIONS Ambient Operating 0° C to + 70° C Temperature Range Deraiting: 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 Operational Insulation 2545 VDC, Primary to Ground, 1 Sec. Operational Insulation 2545 VDC, Primary to Ground, 1 Sec. Operational Insulation 2545 VDC, Primary to Ground, 1 Sec. Operational Insulation 2545 VDC, Primary to Ground, 1 Sec. Operational Insulation 2545 VDC, Primary to Ground, 1 Sec. Operational Insulation 2545 VDC, Primary to Ground, 1 Sec. Operational Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC, Primary to Ground, 1 Sec. Operations Insulation 2545 VDC,	Transient Response	Outputs 1 – 4			
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Output Overvoltage Protection Output Overpower Protection 110-160% rated Pout, cycle on/off, auto recovery Hold Up Time Start Up Time 15 Seconds, 120V Input INPUT SPECIFICATIONS Source Voltage 85 - 264 Volts AC Frequency Range 47 - 63 Hz Peak Inrush Current 40A Efficiency Power Factor 0.95 (Full Power, 230V, varies by model Power Factor O's (Full Power, 230V) ENVIRONIMENTAL SPECIFICATIONS Ambient Operating Temperature Range Ambient Storage Temp. Range Temperature Coefficient Outputs 1 - 4: Output	,				
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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 90wer Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model Power Factor 10.95 (Full Power, 230V, varies by model 10.02% (Full Power, 230V, varies to power sating 10					
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Source Voltage 85 – 264 Volts AC					
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 0° C to + 70° C Temperature Range 27.00 C to + 85° C Temperature Coefficient 37.00 C to + 85° C Temperature Coefficient 38.00 C to + 70° C GENERAL SPECIFICATIONS Means of Protection 39.00 Primary to Secondary 10.00 Primary to Ground 39.00 Primary to Ground					
Frequency Range 47 – 63 Hz Peak Inrush Current 40A Efficiency 82% Typ., Full Power, 230V, varies by model O.95 (Full Power, 230V) ENVIRONMENTAL SPECIFICATIONS Ambient Operating 0° C to + 70° C Derating: See Power Rating Chart Ambient Storage Temp. Range Temperature Coefficient Outputs 1 – 4: 0.02%/°C GENERAL SPECIFICATIONS Means of Protection Primary to Secondary Primary to Ground 1MOPP (Means of Patient Protection) Primary to Ground 1MOPP (Means of Patient Protection) Secondary to Ground 1MOPP (Means of Patient Protection) Primary to Ground 1MOPP (Means of Patient Protection) Primary to Ground 1MOPP (Means of Patient Protection) Primary to Ground 1MOPP (Means of Patient Protection) Secondary to Ground 1MOPP (Means of Patient Protection) Primary to Ground 1Round Insulation (Consult factoryfor 1MOOP or 1MOPP) Primary to Ground 1 Sec. 2545 VDC, Primary to Ground, 1 Sec. 25			C		
Efficiency Power Factor O.95 (Full Power, 230V) ENVIRONMENTAL SPECIFICATIONS Ambient Operating O° C to + 70° C Derating: See Power Rating Chart Ambient Storage Temp. Range Ambient Protection Ambient Storage Temp. Range Ambient Pr	Frequency Range				
Power Factor ENVIRONMENTAL SPECIFICATIONS Ambient Operating O° C to + 70° C Derating: See Power Rating Chart Ambient Storage Temp. Range Ambient Storage Temp. Range Temperature Coefficient Outputs 1 – 4: Outputs 2 – 40° C Because 4 – 40° C to + 85° C Output 1 – 4: Outputs 2 – 40° C to + 85° C Outputs 2 – 40° C to + 85° C Outputs 2 – 40° C to + 85° C Outputs 2 – 40° C to + 85° C Outputs 2 – 40° C to + 85° C Outputs 2 – 40° C to + 85° C Outputs 2 – 40° C to + 85° C Outputs 3 – 40° C to + 85° C Outputs 4 – 4: Outputs 4	Peak Inrush Current				
### Ambient Operating ### Comparing	Efficiency				
Ambient Operating Temperature Range Ambient Storage Temp. Range Ambient Storage Temp. Range Temperature Coefficient GENERAL SPECIFICATIONS Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Secondary to Ground Operational Insulation Dielectric Strength(15) Reinforced Insulation Dienetric Strength(15) Reinforced Insulation Dienetric Strength(16) Reinforced Insulation Dienetric Strength(17) Dienetric Strength(17) Rec. Dienetric Strength(17)					
Temperature Range			NS		
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 Secondary to Ground Operational Insulation (Consult factory for 1MOOP or 1MOPP) Dielectric Strength(15) Reinforced Insulation 5656 VDC, Primary to Secondary, 1 Sec. Basic Insulation 2545 VDC, Primary to Ground, 1 Sec. Operational Insulation 2545 VDC, Primary to Ground, 1 Sec. Operational Insulation 2545 VDC, Primary to Ground, 1 Sec. Operational Insulation 2545 VDC, Primary to Ground, 1 Sec. Operational Insulation 2555 VDC, Primary to Ground, 1 Sec. Operational Insulation 2555 VDC, Primary to Ground, 1 Sec. Operational Insulation 2555 VDC, Primary to Ground, 1 Sec. Operational Insulation 2556 VDC, Pr			5 11 01 1		
Temperature Coefficient GENERAL SPECIFICATIONS Means of Protection Primary to Ground Secondary to Ground Secondary to Ground Secondary to Ground Dielectric Strength(15) Reinforced Insulation Operational Insulation Operational Insulation Sound NC, Primary to Secondary, 1 Sec. 2545 VDC, Primary to Ground, 1 Sec. Operational Insulation Operational Insulation(Consult factory for 1MOOP or 1MOPP) Operational Insulation (Consult factory for 1MOOP or 1MOPP Operational Insulation (Consult factory for 1MOOP or			· ·		
GENERAL SPECIFICATIONS Means of Protection Primary to Secondary 2MOPP (Means of Patient Protection) Primary to Ground Operational Insulation (Consult factoryfor 1MOOP or 1MOPP) Dielectric Strength ₍₁₅₎ Reinforced Insulation 5656 VDC, Primary to Secondary, 1 Sec. Basic Insulation 2545 VDC, Primary to Ground, 1 Sec. Operational Insulation 2545 VDC, Primary to Ground, 1 Sec. Leakage Current <300uA NC, <1000uA SFC					
Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength(15) Reinforced Insulation Operational Insulation(Consultfactoryfor 1MOOP or 1MOPP) Dielectric Strength(15) Reinforced Insulation Basic Insulation Operational Insulation(Consultfactoryfor 1MOOP or 1MOPP Operational Insulation(Consultfactoryfor 1MOOP or 1MOOP Operational Insulation(Consultfactoryfor 1MOOP Operational Insulation Oper			0.02%/°C		
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Dielectric Strength ₍₁₅₎ Reinforced Insulation Basic Insulation Coperational Insulation Coperational Insulation Eakage Current Signal Contact closure shuts off all outputs		,	,		
Reinforced Insulation Basic Insulation Operational Insulation Operational Insulation Operational Insulation Operational Insulation Eakage Current 300uA NC, <1000uA SFC <100uA NC, <500uA SFC 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 Description of output cable losses Mean-Time Between Failures 100,000 Hours min., MIL-HDBK-217F, 25° C, GB Weight Description of Operation of Operatio	Secondary to Ground	Operational Insu	lation(Consult factory for 1MOOP or 1MOPP		
Basic Insulation Operational Insulation Operational Insulation Z545 VDC, Primary to Ground, 1 Sec. 707 VDC, Secondary to Ground, 1 Sec. 2300uA NC, <1000uA SFC 2500uA SFC 2100uA 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 EN 61000-4-2 EN 61000-4-3 BOMHz-2.5GHz, 10/m, 80% AM EFT/Bursts EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-1 Sources EN 61000-4-	Dielectric Strength ₍₁₅₎				
Operational Insulation Leakage Current					
Leakage Current <300uA NC, <100uA 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) 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 EN 61000-4-2 EN 61000-4-3 Souther-2.5GHz, 10/m, 80% AM EFT/Bursts EN 61000-4-3 EN 61000-4-4 ± 2 kV Surges EN 61000-4-5 ± 1 kV Common/ ± 2 kV Differential Mode Conducted Immunity EN 61000-4-1 130% Reduction, 500ms 95% Reduction, 10 (Criteria B) 95% Reduction, 10 (Sriteria B) 95% Reduction, 5 Reduction 500ms Voltage Interruptions EN 61000-4-1 EN 61000-4-1 95% Reduction, 5 Calss B Conducted Emissions EN 55011/22 Class B EN 61000-3-2					
<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 EN 61000-4-3 80MHz-2.5GHz, 10/m, 80% AM EFT/Bursts EN 61000-4-4 EN 61000-4-5 ± 1kV Common/ ± 2kV Differential Mode Conducted Immunity EN 61000-4-11 Som Reduction, 500ms 95% Reduction, 10ms 60% Reduction, 1s (Criteria B) 95% Reductions, 5000ms Voltage Interruptions EN 61000-4-11 EN 61000-4-11 95% Reduction, 5 Conducted Emissions EN 65011/22 Class B Conducted Emissions EN 55011/22 Class B Harmonic Current Emissions EN 61000-3-2		707 VDC, Secon	idary to Ground, 1 Sec.		
Conducted Immunity Conduct	Leakage Current	<300uA NC. <10	000uA SEC		
Power Fail Signal Logic low with input power failure 10 mS minimum prior to Output 1 dropping 1% Remote On/Off (optional) 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 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-5 EN 61000-4-5 EN 61000-4-5 EN 61000-4-1 Surges EN 61000					
minimum prior to Output 1 dropping 1% Remote On/Off (optional) 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 EN 61000-4-3 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-5 EN 61000-4-5 EN 61000-4-5 EN 61000-4-1 Surges EN 61000-4-1 Surges EN 61000-4-1 Sunday EN 61000-4-1 EN 61000-4-1 Sunday EN 61000-4-1 EN 6	Power Fail Signal	Logic low with in	put power failure 10 mS		
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, 10 (Criteria B) 95% Reduction, 15 (Criteria B) 95% Reduction, 500ms EN 61000-4-11 95% Reduction, 55 Conducted Emissions EN 55011/22 Class B Conducted Emissions EN 55011/22 Class B Harmonic Current Emissions EN 61000-3-2					
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 ± 1kV Common/ ± 2kV 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% Reduction, 500ms 95% Reduction, 5s Radiated Emissions EN 55011/22 Class B Conducted Emissions EN 55011/22 Class B Harmonic Current Emissions EN 61000-3-2 Class B	Remote On/Off (optional)				
Weight 1.15 Lbs. Open Frame/ 1.82 Lbs. Chassis and Cover ELECTROMAGNETIC COMPATIBILITY SPECIFICATIONS Electrostatic Discharge EN 61000-4-2 EN 61000-4-3 EN 61000-4-3 EN 61000-4-4 EN 61000-4-4 EN 61000-4-5 EN 61000-4-5 EN 61000-4-5 EN 61000-4-6 EN 61000-4-6 EN 61000-4-6 EN 61000-4-1 Summon/ ± 2 kV Differential Mode Conducted Immunity EN 61000-4-1 30% Reduction, 500ms 95% Reduction, 10ms 60% Reduction, 1s (Criteria B) 95% Reduction, 500ms Voltage Interruptions EN 61000-4-11 PS% Reduction, 5 Conducted Emissions EN 61000-4-11 Class B Conducted Emissions EN 55011/22 Class B Harmonic Current Emissions EN 61000-3-2		250mV compens	sation of output cable losses		
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 ± 1kV Common/ ± 2kV 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					
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 ± 1kV Common/ ± 2kV 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					
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 ± 1kV Common/ ± 2kV 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, 1 (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					
EFT/Bursts EN 61000-4-4 ±2 kV Surges EN 61000-4-5 ± 1kV Common/ ± 2kV 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 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					
Surges EN 61000-4-5 ± 1kV Common/ ± 2kV 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 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					
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 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 Dips and Interruptions EN 61000-4-11 30% Reduction, 500ms 95% Reduction, 10ms 60% Reduction, 1s (Criteria B) 95% Reduction, 1s (Criteria B) 95% Reductions, 5000ms Voltage Interruptions EN 61000-4-11 95% Reduction, 5s Reduction, 5s Radiated Emissions EN 55011/22 Class B Conducted Emissions EN 55011/22 Class B Harmonic Current Emissions EN 61000-3-2					
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	go Dipo and intorruptions	2 0.000 111			
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			60% Reduction, 1s (Criteria B)		
Radiated Emissions EN 55011/22 Class B Conducted Emissions EN 55011/22 Class B Harmonic Current Emissions EN 61000-3-2					
Conducted Emissions EN 55011/22 Class B Harmonic Current Emissions EN 61000-3-2		EN 61000-4-11			
Harmonic Current Emissions EN 61000-3-2					
	Radiated Emissions				
	Radiated Emissions Conducted Emissions	EN 55011/22			

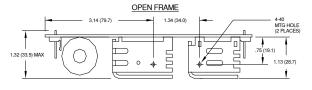
ORDERING INFORMATION

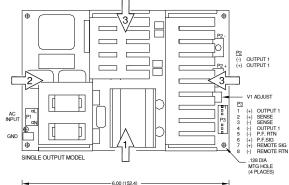
Please specify the following optional features when ordering:

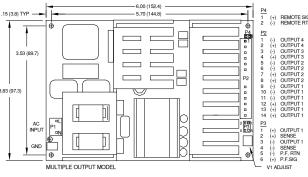
CH - Chassis RE - Remote inhibit I/O - Isolated outputs CO - Cover TS - Terminal Strip

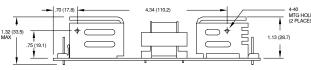


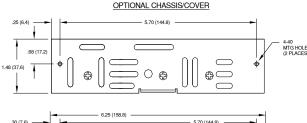
REL-150 SERIES MECHANICAL SPECIFICATIONS

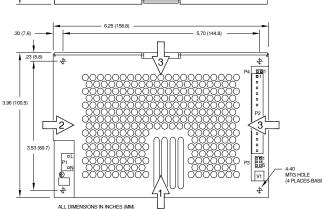












NOTES

Consult factory for alternate output configurations.

Consult factory for positive, negative or floating outputs.

Refer to Applications Information for complete output power ratings.

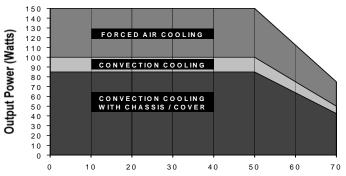
All specifications are maximum at 25° C, 150W unless otherwise stated, may vary by model and are subject to change without notice.

TUV only: REL-110-4010

APPLICATIONS INFORMATION

- 1. Rated 12A maximum with convection cooling
- Rated 20A maximum with convection cooling.
- 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.
- 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.
- Each output can deliver its rated current but total output power must not exceed maximum power as determined by the cooling method stated above.
- Sufficient area must be provided around convection cooled power supplies to allow natural movement of air to develop.
- 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.
- This product is intended for use as a professionally installed component within information technology and medical equipment.
- 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 $(0.1 10\mu F)$ and a capacitor of $100\mu F$ /amp connected across the load side.
- 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.
- 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.
- To meet emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/cover option recommended.
- 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



		Ambient Temperature (C)
CO	NNECTOR S	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	.100 breakaway header mates with Molex 50-57-9002 or

RECOMMENDED AIR FLOW DIRECTION

1 – Optimum 2 – Good

(Multiple)

Good

equivalent crimp terminal.

3 – Fair

equivalent crimp terminal housing with Molex type 71851 or