



- 2 Year Warranty
- Universal 85-264V Input
- Single, Dual or Triple Outputs
- 0-70°C Operating Temperature
- Compact 2.25" x 4.00" x .96" Size 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 Chassis/Cover





CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c FL us	Underwriters Laboratories	UL 60950-1:2007, 2 nd Edition
C # 100	File E137708/E140259	AAMI/ANSI ES60601-1:2005/(R) 2012
		CB Reports/Certificates (including all
11-161-1		National and Group Deviations)
CB SCHEME		IEC 60950-1/A2:2013, 2nd Edition
SCHEME		IEC 60601-1:2005/A1:2012
c FL us	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
SUD SUD	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING				
MODEL NO.	OUTPUT 1	OUTPUT 2	OUTPUT 3	
SRP-25-3001	+5V/3A	+12V/1.5A	-12V/0.5A	
SRP-25-3002	+5V/3A	+15V/1.5A	-15V/0.5A	
SRP-25-3003	3.3V/2.5A	6V/2A	5V/1A	
SRP-25-2001	+5V/3A	+24V/1A		
SRP-25-2002	+5V/3A	+12V/1.5A		
SRP-25-2003	+5V/3A	-5V/2A		
SRP-25-2004	+12V/1.5A	-12V/1.5A		
SRP-25-2005	+15V/1.5A	-15V/1.5A		
SRP-25-1001	3.3V/6A			
SRP-25-1002	5V/5A			
SRP-25-1003	12V/2.08A			
SRP-25-1004	15V/1.67A			
SRP-25-1005	24V/1.04A			
SRP-25-1006	48V/0.52A			

ORDERING INFORMATION

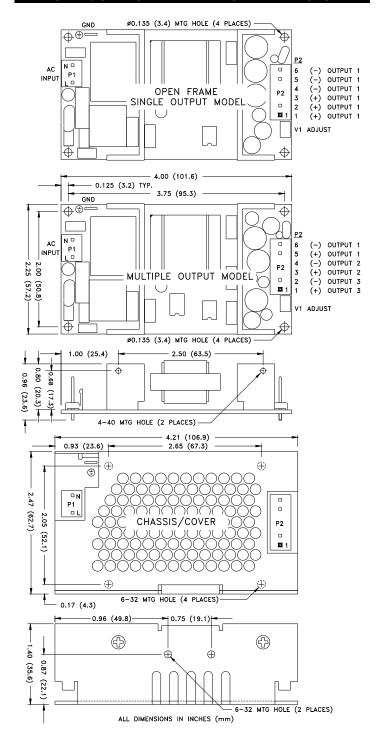
Consult factory for alternate output configurations. Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:

CH - Chassis I/O - Isolated Outputs TS - Terminal Strip CO - Cover

OUT	PUT SPECIF	ICATIO	NS
Total Output Power ₍₁₎	25W (20W, 1001)	
(See Derating Chart) Output Voltage Centering	Output 1	. 0.250/	/All autouta
Output Voltage Centering	Output 1: Output 2:	± 0.25% ± 5.0%	(All outputs at 50% load)
	Output 3:	± 3.0% ± 2.0%	at 50 % load)
Output Voltage Adjust Range	Output 1:	95 - 105%	<u></u>
Load Regulation	Output 1:	0.5%	(0-100% load change)
Load Regulation	Output 2:	5.0%	(10-100% load change)
	Output 2: (2003)	6.0%	(30-100% load change)
	Output 3:	1.0%	(0-100% load change)
Source Regulation	Outputs 1 – 3:	0.5%	
Cross Regulation	Output 2:	5.0%	(Output 1 load
Outrot Naiss	Output 3:	2.0%	varied 50-100%)
Output Noise	Outputs 1-3	1.0%	
Turn on Overshoot Transient Response	None Outputs 1 – 3		
Voltage Deviation	5.0%		
Recovery Time	1ms		
Load Change	50% to 100%		
Output Overvoltage	Output 1:	110% to 15	50%
Protection (optional)			
Output Overcurrent Protection	Output 3:	110% Min.	
Output Overpower Protection	Outputs 1 & 2:	110% Min.	
Hold Un Timo	Outputs cycle on 10ms min., 25W	Output 120	COVERY
Hold Up Time Start Up Time	1 Second	Output, 12t	ov input
	UT SPECIFIC	ATION	9
Protection Class	OT SPECIFIC	ATION	
Source Voltage	85 – 264 Volts A	Ω.	
Frequency Range	47 – 63 Hz	<u> </u>	
Source Current			
True RMS	0.8A at 85V Inpu	t	
Peak Inrush	30 A		
Efficiency	0.66 - 0.72 (Varie	es by model)
	MENTAL SP	ECIFIC	ATIONS
Ambient Operating	0°C to + 70°C	Б. г	01 1
Temperature Range	Derating: See Po		Chart
Ambient Storage Temp. Range	- 40°C to + 85°C		/ 100
Temperature Coefficient	Outputs 1 – 3:	0.029	
Means of Protection	RAL SPECIF	-ICATIC	DNS
Primary to Secondary	2MOPP (Means	of Patient P	Protection)
Primary to Ground			rotection) (1MOOP-Singles)
Secondary to Ground			ult factory for 1MOOP or 1MOPP)
Dielectric Strength _(8, 9)			
Reinforced Insulation	5656 VDC, Prima		
Basic Insulation	2121 VDC, Prima		
Operational Insulation	707 VDC, Seco	ndary to Gr	ound
Leakage Current Earth Leakage	<300µA NC, <10	INDIA SEC	
Touch Current	<100µA NC, <50		
Mean-Time Between Failures			DBK-217F, 25° C, GB
Weight		en Frame	75K 2171 , 23 G, GB
Weight		issis and Co	over
EMC SPECIFICATION:			
Electrostatic Discharge	EN 61000-4-2		ntact / ±15KV air discharge A
Radiated Electromagnetic Field			7GHz, 10V/m, 80% AM A
	EN 61000-4-3		
Electrical Fast Transients/Bursts	EN 61000-4-3 EN 61000-4-4		KHz/100KHz A
Electrical Fast Transients/Bursts		±2 KV, 5k ±2 KV line	e to earth / ±1 KV line to line A
	EN 61000-4-4	±2 KV, 5k ±2 KV line	e to earth $/ \pm 1$ KV line to line A
Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	EN 61000-4-4 EN 61000-4-5	±2 KV, 5k ±2 KV line	e to earth / ±1 KV line to line A MHz, 10V, 80% AM A
Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity	EN 61000-4-4 EN 61000-4-5 EN 61000-4-6	±2 KV, 5k ±2 KV line 0.15 to 80 30A/m, 60 0% U _T , 0.	e to earth / ±1 KV line to line A MHz, 10V, 80% AM A D Hz. A 5 cycles, 0-315° 100/240V A/A
Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	±2 KV, 5k ±2 KV line 0.15 to 80 30A/m, 60 0% U _T , 0. 0% U _T , 1	e to earth / ±1 KV line to line A MHz, 10V, 80% AM A D Hz. A S cycles, 0-315° 100/240V A/A cycles, 0° 100/240V A/A
Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	±2 KV, 5k ±2 KV line 0.15 to 80 30A/m, 60 0% U _T , 0. 0% U _T , 1 40% U _T , 1	e to earth / ±1 KV line to line A MHz, 10V, 80% AM A D Hz. A 5 cycles, 0-315° 100/240V A/A cycles, 0° 100/240V B/A 10/12 cycles, 0° 100/240V B/A
Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips	EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8 EN 61000-4-11	±2 KV, 5k ±2 KV line 0.15 to 80 30A/m, 60 0% U _T , 0. 0% U _T , 1 40% U _T , 1 70% U _T , 2	e to earth / ±1 KV line to line A MHz, 10V, 80% AM A) Hz. A) Hz. A 5 cycles, 0°315° 100/240V A/A cycles, 0° 100/240V A/A 10/12 cycles, 0° 100/240V B/A 25/30 cycles, 0° 100/240V B/A
Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips Voltage Interruptions	EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-11 EN 61000-4-11	±2 KV, 5k ±2 KV line 0.15 to 80 30A/m, 60 0% U _T , 0. 0% U _T , 1 40% U _T , 1 70% U _T , 2 0% U _T , 30	e to earth / ±1 KV line to line A MHz, 10V, 80% AM A D Hz. A 5 cycles, 0-315° 100/240V A/A cycles, 0° 100/240V A/A 10/12 cycles, 0° 100/240V B/A 25/30 cycles, 0° 100/240V B/A
Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips Voltage Interruptions Radiated Emissions	EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8 EN 61000-4-11 EN 61000-4-11 EN 55011/32	±2 KV, 5k ±2 KV line 0.15 to 80 30A/m, 60 0% Uτ, 0. 0% Uτ, 1 40% Uτ, 1 70% Uτ, 2 0% Uτ, 30 Class B	e to earth / ±1 KV line to line A MHz, 10V, 80% AM A) Hz. A) Hz. A 5 cycles, 0°315° 100/240V A/A cycles, 0° 100/240V A/A 10/12 cycles, 0° 100/240V B/A 25/30 cycles, 0° 100/240V B/A
Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips Voltage Interruptions	EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-11 EN 61000-4-11	±2 KV, 5k ±2 KV line 0.15 to 80 30A/m, 60 0% U _T , 0. 0% U _T , 1 40% U _T , 1 70% U _T , 2 0% U _T , 30	e to earth / ±1 KV line to line A MHz, 10V, 80% AM A) Hz. A 5 cycles, 0°315° 100/240V A/A cycles, 0° 100/240V A/A 10/12 cycles, 0° 100/240V B/A 25/30 cycles, 0° 100/240V B/A

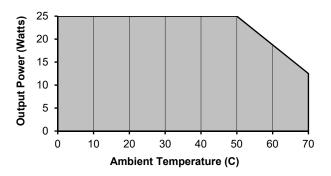
All specifications are maximum at 25°C/25W unless otherwise stated, may vary by model and are subject to change without notice.

SRP-25 SERIES MECHANICAL SPECIFICATIONS



APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 25W.
- 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.
- 8. 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 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.
- 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 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.



	CONNECTOR SPECIFICATIONS				
P1	AC Input	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.			
P2	DC Output	0.156 friction lock header mates with Molex 09-50-3061 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.			
G	Ground	0.187 quick disconnect terminal.			

SINGLE/MULTI OUTPUT AC-DC

FEATURES:

- 2 Year Warranty
- Universal 85-264V Input
- One to Four Outputs • 0-70°C Operating Temperature
- Compact 2.5" x 4.25" x 1.2" Size 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 Chassis/Cover





CHASSIS/COVER

OPEN FRAME

	SAFETY SPEC	CIFICATIONS
	Underwriters Laboratories	UL 60950-1:2007, 2nd Edition
c 744 us	File E137708/E140259	AAMI/ANSI ES60601-1:2005/(R) 2012
		CB Reports/Certificates (including all
TEGE:		National and Group Deviations)
CB SCHEME		IEC 60950-1/A2:2013, 2nd Edition
SCHEME		IEC 60601-1:2005/A1:2012
c 711 us	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 SUD No. 15 TO TO	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
ϵ	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING					
MODEL NO.	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4	
SRP-40A-4001	+3.3V/5A	+5V/3A	+12V/0.7A	-12V/0.7A	
SRP-40A-4002	+5V/5A	+3.3V/3A	+12V/0.7A	-12V/0.7A	
SRP-40A-4003	+5V/5A	-5V/3A	+12V/0.7A	-12V/0.7A	
SRP-40A-4004	+5V/5A	-5V/3A	+15V/0.7A	-15V/0.7A	
SRP-40A-4005	+5V/5A	+24V/1.5A	+12V/0.7A	-12V/0.7A	
SRP-40A-4006	+5V/5A	+24V/1.5A	+15V/0.7A	-15V/0.7A	
SRP-40A-4007	+3.3V/3.1A	+5V/1.25A	-24V/.27A	-51.6V/.25A	
SRP-40A-3001	+5V/5A	+12V/2A	-12V/0.7A		
SRP-40A-3002	+5V/5A	+15V/2A	-15V/0.7A		
SRP-40A-3003	+24V/1.5A		+15V/0.7A	-15V/0.7A	
SRP-40A-3004	+14.5V/1.5A	-14.5V/1.5A	+5V/1A		
SRP-40A-3005	+5.1V/5A	+15V/2A	+9V/0.7A		
SRP-40A-2001	+5V/5A	+24V/1.5A			
SRP-40A-2002	+5V/5A	+12V/3A			
SRP-40A-2003	+5V/5A	-5V/4A			
SRP-40A-2004	+12V/3A	-12V/3A			
SRP-40A-2005	+15V/2.5A	-15V/2A			
SRP-40A-2006	+30V/1.2A		-15V/0.7A		
SRP-40A-2007	+3.3V/5A		+5V/0.7A		
SRP-40A-2008	+6V/5A	+9V/1A			
SRP-40A-1001	3.3V/10A				
SRP-40A-1002	5V/8A				
SRP-40A-1003	12V/3.33A				
SRP-40A-1004	15V/2.67A				
SRP-40A-1005	24V/1.67A				
SRP-40A-1006	48V/0.83A				
SRP-40A-1007	9V/4.45A				
SRP-40A-1008	12V/3.33A				

ORDERING INFORMATION

Consult factory for alternate output configurations. Consult factory for positive, negative or floating Output 2. Specify DC Input when ordering SRP-40A-3003 only. Please specify the following optional features when ordering:

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

	2KL-7	IUA
	PUT SPECIF	
Total Output Power at 50°C ₍₁₎ (See Derating Chart)	40W (33W, 100	
Output Voltage Centering	Output 1:	± 0.25% (All outputs
, 5	Output 2:	± 5.0% at 50% load)
	Output 3:	± 3.0%
	Output 4:	± 3.0%
Output Voltage Adjust Range	Output 1:	95 - 105%
Load Regulation	Output 1:	0.5% (10-100% load change)
	Output 2:	5.0% (30-100% load change)
	(2003,4002)	7.0% (30-100% load change)
	Output 3:	0.5% (10-100% load change)
Course Degulation	Output 4: Outputs 1 – 4:	0.5% (10-100% load change)
Source Regulation Cross Regulation	Output 2:	0.5% 5.0% (Output 1
Cross Regulation	Output 3:	5.0% (Output 1 0.5% varied 50-100%)
	Output 4:	0.5% Varied 50-1007/)
Output Noise	Outputs 1 - 4:	1.0%
Turn on Overshoot	None	
Transient Response	Outputs 1 – 4	
Voltage Deviation	5.0%	
Recovery Time	2 ms	
Load Change	50% to 100%	
Output Overvoltage Protection	Output 1:	110% to 150%
Output Overcurrent Protection	Outputs 3 & 4:	110% Min.
Output Overpower Protection	Outputs 1 & 2:	110% Min.
Hold I In Timo	10 ms min 40	n/off, auto recovery W Output, 120V Input
Hold Up Time Start Up Time	10 ms min., 40 1 Second	vv Output, 120v IIIput
	UT SPECIFI	CATIONS
Protection Class		CAFIONO
Source Voltage	85 – 264 Volts /	AC
Frequency Range	47 – 63 Hz	•
Source Current		
True RMS	1A at 85V Input	
Peak Inrush	30 A	
Efficiency	0.66 - 0.80 (Var	
		PECIFICATIONS
Ambient Operating	0° C to + 70° C	
Temperature Range		Power Rating Chart
Ambient Storage Temp. Range	- 40° C to + 85°	
Temperature Coefficient	Outputs 1 – 4:	0.02%/°C
Means of Protection	ERAL SPEC	FICATIONS
Primary to Secondary	2M∩PD (Maana	s of Patient Protection)
Primary to Ground		s of Patient Protection)
Secondary to Ground	OperationalIns	ulation(Consult factory for 1MOOP or 1MOP
Dielectric Strength _(8, 9)		(constanting of the constanting
Reinforced Insulation	5656 VDC, Prin	nary to Secondary
Basic Insulation	2121 VDC, Prin	nary to Ground
Operational Insulation	707 VDC, Sec	ondary to Ground
Leakage Current		
Earth Leakage	<300µA NC, <1	000μA SFC
Touch Current	<100µA NC, <5	OUUHA SEC
Mean-Time Between Failures		min., MIL-HDBK-217F, 25° C, GB
Weight		pen Frame
EMC SPECIFICATION		nassis and Cover -2:2014, 4 TH ED./IEC 61000-6-2:2005
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge
Radiated Electromagnetic Field	EN 61000-4-2 EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM
Electrical Fast Transients/Bursts	EN 61000-4-3	±2 KV, 5KHz/100KHz
Surge Immunity	EN 61000-4-4	± 2 KV, 5KHZ/100KHZ ± 2 KV line to earth / ± 1 KV line to line
Surge inimunity Conducted Immunity	EN 61000-4-5 EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.
Voltage Dips	EN 61000-4-6 EN 61000-4-11	0% U _T , 0.5 cycles, 0-315° 100/240V <i>F</i>
vollage Dips	LIN U 1000-4-11	0% U _T , 1 cycles, 0° 100/240V A
		40% U _T , 10/12 cycles, 0° 100/240V E
		70% U _T , 25/30 cycles, 0° 100/240V E
Voltage Interruptions	EN 61000-4-11	0% U _T , 300 cycles, 0° 100/240V E
Radiated Emissions	FN 55011/32	

All specifications are maximum at $25^{\circ}\text{C}/40\text{W}$ unless otherwise stated, may vary by model and are subject to change without notice.

EN 55011/32

EN 55011/32

EN 61000-3-2

EN 61000-3-3

Class B

Class B

Class A

Compliant

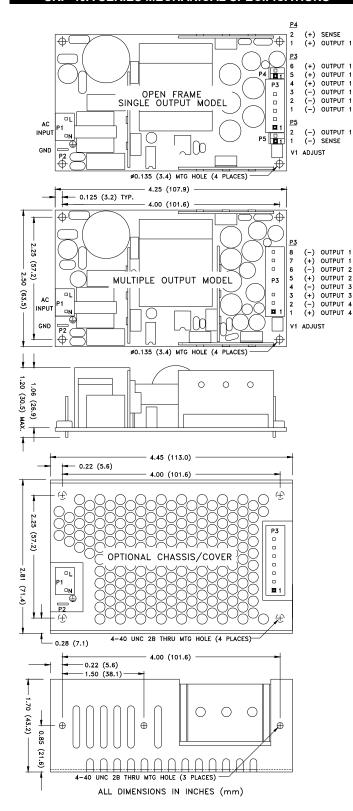
Radiated Emissions

Conducted Emissions

Harmonic Current Emissions

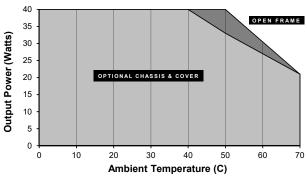
Voltage Fluctuations/Flicker

SRP-40A SERIES MECHANICAL SPECIFICATIONS



APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 40W (33W, 1001).
- 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.
- 4. 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.
- 8. 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, 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 0.250 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.
- Maximum Ambient Temperature is reduced to 40°C with optional Chassis and Cover. See chart below.



		CONNECTOR SPECIFICATIONS
P1	AC Input	0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.
P3	DC Output (Single)	0.156 friction lock header mates with Tyco 770849-6 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.
P3	DC Output (Multiple)	0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.
P4,P5	Sense	0.100 friction lock header mates with Molex 22-01-2027 or equivalent crimp terminal housing with Molex 08-50-0114 or equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.

SINGLE/MULTI OUTPUT AC-DC

FEATURES:

- Compact 3.3" x 5" x 1.5" Size
- 2 Year Warranty
- Universal 85-264V Input
- 1-4 Tightly-Regulated Outputs
- 0-70°C Operating Temperature
- RoHS Compliant
- 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
- Optional Power Fail Warning
- Optional Perforated Cover





CHASSIS/COVER

OPEN CHASSIS

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

MODEL LISTING

MODEL NO. OUTPUT 1 OUTPUT 2 OUTPUT 3 OUTPUT 4

SRW-100-4001	+3.3V/10A(17)	+5V/4A	+12V/2A(18)	-12V/1A
SRW-100-4002	+5V/10A(17)	+24V/2A	+12V/2A(18)	-12V/1A
SRW-100-4003	+5V/10A(17)	+24V/2A	+15V/2A(18)	-15V/1A
SRW-100-4004	+5V/10A(17)	-5.2V/4A	+12V/2A(18)	-12V/1A
SRW-100-4005	+5V/10A(17)	-5.2V/4A	+15V/2A(18)	-15V/1A
SRW-100-4006	+5V/10A(17)	+3.4V/4A	+9V/1A	24V/.50A
SRW-100-4007	+5V/10A(17)	+15V/3A	+12V/2A	-12V/1A
SRW-100-4008	+5V/10A(17)	+3.3V/4A	+12V/2A	-5V/1A
SRW-100-4009-IT	+3.3V/10A(17)	+5V/4A	+12V/2A	-5V/1A
SRW-100-4010	+5V/5A	+15V/4A	+12V/2A(18)	9V/2.5A
SRW-100-4011	+5V/10A(17)	-15V/2.2A	+15V/2A(18)	12V/1A
SRW-100-4012	+5V/10A(17)	+3.3V/4A	+12V/2A(18)	-12V/1A
SRW-100-3001	+5V/10A(17)	+12V/4A		-12V/1A
SRW-100-3002	+5V/10A(17)	+15V/3A		-15V/1A
SRW-100-3003	+5V/10A(17)	+3.3V/8A		12V/1A
SRW-100-3004	+3.3V/5A	+5.8V/3A		-48V/1A
SRW-100-2001	+12V/5A	-12V/4A		
SRW-100-2002	+15V/5A	-15V/3A		
SRW-100-2003	+12.5V/4A	+16V/2A		
SRW-100-1001	3.3V/20A(19)			
SRW-100-1002	5V/20A			
SRW-100-1003	12V/8.3A			
SRW-100-1004	15V/6.7A			
SRW-100-1005	24V/4.2A			
SRW-100-1006	28V/3.6A			
SRW-100-1007	48V/2.1A			
SRW-100-1008	40V/2.5A			
 SRP-100-4001	+5V/12A(17)	+24V/3A	+12V/2A(18)	-12V/1A
SRP-100-4002	+5V/12A(17)	+24V/3A	+15V/2A(18)	-15V/1A
SRP-100-4003	+5V/12A(17)	-5V/4A	+12V/2A(18)	-12V/1A
SRP-100-4004	+5V/12A(17)	-5V/4A	+15V/2A(18)	-15V/1A
SRP-100-4005	+5V/12A(17)	+12V/3A	+8V/2A	-8V/1A
 SRP-100-3001 SRP-100-2001	+5V/12A(17)	+12V/4A +24V/3A		-12V/1A
3KP-100-2001	+5V/12A(17)	+24V/3A		

SRW/SRP-100

0.1	,				
OUTF	PUT SPECIF	ICATIONS			
Total Output Power at 50°C ₍₁₎	70W	Convection Cooled			
(See Derating Chart)	85W	Convection Cooled w/1Sq.ft baseplate(16)			
	100W	200LFM Forced-Air Cooled(15)			
Output Voltage Centering	Output 1:	± 0.25% (All outputs at 50% load)			
	Output 2: (SRW)	± 0.25%			
	(SRP)				
	Output 3:	± 2.0%			
	Output 4:	± 4.0%			
Output Voltage Adjust Range	Output 1:	95 - 105%			
, , ,		85 - 105% (1001, 4001)			
	Output 2:	95 - 105% (SRW models only)			
Load Regulation	Output 1:	0.5% (10-100% load change)			
-	Output 2: (SRW)	0.5% (10-100% load change)			
	(SRP)	5.0% (10-100% load change)			
	Output 3:	1.0% (10-100% load change)			
	Output 4:	1.0% (10-100% load change)			
Source Regulation	Outputs 1 – 4:	0.5%			
Cross Regulation	Output 2: (SRW)				
	(SRP)				
	Output 3:	0.2%			
-	Output 4:	0.2%			
Output Noise	Outputs 1 - 4:	1.0%			
Turn on Overshoot	None				
Transient Response	Outputs 1 – 4				
Voltage Deviation	5.0%				
Recovery Time	2mS				
Load Change	50% to 100%				
Output Overvoltage Protection	Output 1:	110% to 150%			
(optional)					
Output Overpower Protection	Outputs 1 & 2:	110W Min.			
		off, auto recovery			
Output Overcurrent Protection	Outputs 3 & 4:	110% Min.			
Hold Up Time		/ Output, 120V Input			
Start Up Time	1 Second				
INPUT SPECIFICATIONS					
Danta attan Olara	1				

	IN OT OF ECH ICATIONS	
Protection Class	1	
Source Voltage	85 – 264 Volts AC	
Frequency Range	47 – 63 Hz	
Source Current		
True RMS	3A at 85V Input	
Peak Inrush	30A	
Efficiency	0.68-0.84 (varies by model)	

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		

Temperature Coefficient	Outputs 1 – 4: 0.02%/°C
GEN	ERAL 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 (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	<500μA NC, <1000μA SFC
Touch Current	<100µA NC, <500µA SFC
Power Fail Signal	Logic low with input power failure 2ms
(optional) ₍₁₄₎	minimum prior to Output 1 dropping 1%
Remote Sense(single	250mV compensation of output cable losses
Output Models only)(10)	
Mean-Time Between Failures	150,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	1.00 Lbs. Open Frame
	1.05 Lbs. w/Cover

ORDERING INFORMATION

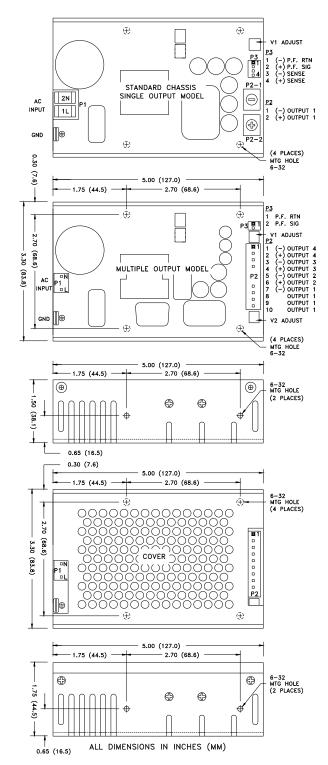
Consult factory for alternate output configurations. Consult factory for positive, negative or floating outputs. Please specify the following optional features when ordering:

CO - Cover I/O - Isolated Outputs PF - Power Fail TS - Terminal Strip OVP - Overvoltage Protection

All specifications are maximum at $25^{\circ}\text{C}/100\text{W}$ unless otherwise stated, may vary by model and are subject to change without notice.

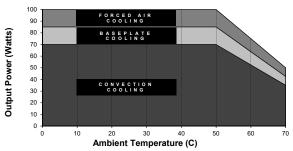
EMOODEOJEJO ATJONIO			
EMC SPECIFICATIONS	5 (IEC 60601-1-2	2:2014, 4 TH ed./IEC 61000-6-2:20	05)
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge	Α
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM	Α
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz	Α
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to lin	e A
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM	Α
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.	Α
Voltage Dips	EN 61000-4-11	0% U _T , 0.5 cycles, 0-315° 100/240\	/ A/A
		0% U _T , 1 cycles, 0° 100/240V	A/A
		40% U _T , 10/12 cycles, 0° 100/240V	B/A
		70% U _T , 25/30 cycles, 0° 100/240V	B/A
Voltage Interruptions	EN 61000-4-11	0% U _T , 300 cycles, 0° 100/240V	B/B
Radiated Emissions	EN 55011/32	Class B	
Conducted Emissions	EN 55011/32	Class B	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

SRW/SRP-100 SERIES MECHANICAL SPECIFICATIONS



APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 70, 85 or 100W, 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.
- 8. 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 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
 9. This power supply has been safety-approved and final-tested using a DC dielectric.
- 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.
- 10. Remote-Sense terminals may be used to compensate for cable losses up to 250mV, 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 chassis mounting holes is 0.125 inches.
- 12. 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 2ms prior to loss of output from AC failure.
- Forced-Air cooling rating of 100W requires an air speed of 200LFM flowing past a point one inch above the main isolation transformer.
- Baseplate cooling rating of 85W requires a one-square-foot 0.09"-thick aluminum area attached to bottom four mounting holes.
- 17. Rated 8A maximum when convection cooled only.
- 18. Rated 1A maximum when convection cooled only.
- Rated 50W maximum output power when convection cooled; 70W when baseplate or forced-air cooled.



		CONNECTOR SPECIFICATIONS
P1	AC Input	Terminal block with 4-40 inch screws on 0.325 inch centers
	(Single)	with #4 spade terminals.
P1	AC Input	0.156 friction lock header mates with Molex 09-50-3031 or
	(Multiple)	equivalent crimp terminal housing with Molex 08-50-0189 or
		equivalent crimp terminal.
P2	DC Output	6-32 screw down terminal mates with #6 ring tongue
	(Single)	terminal. (10 in-lb max.)
P2	DC Output	0.156 friction lock header mates with Molex 09-50-3101 or
	(Multiple)	equivalent crimp terminal housing with Molex 08-50-0189 or
		equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	Option/Sense	0.100 friction lock header mates with Molex 22-01-2047or
	(Single)	equivalent crimp terminal housing with Molex 6459 or equivalent
		crimp terminal.
P3	Option	0.100 friction lock header mates with Molex 22-01-2027or
	(Multiple)	equivalent crimp terminal housing with Molex 6459 or equivalent
		crimp terminal.

- Compact 2.5" x 4.25" x 1.0" Size
- 3 Year Warranty
- Universal 85-264V Input
- · Dual, Triple or Quad Outputs
- 86% Peak Efficiency
- 85% Average Efficiency
- <1W No Load Input Power
- 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 • 0-70°C Operating Temperature
- **RoHS Compliant**
- Optional Chassis/Cover





CHASSIS/COVER

OPEN FRAME

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

MODEL LISTING				
MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
GRN-45-4001	+3.3V/5.0A	+5.0V/5.0A	+12V/1.0A	-12V/1.0A
GRN-45-4002	+5.0V/5.0A	-5.0V/5.0A	+12V/1.0A	-12V/1.0A
GRN-45-4003	+5.0V/5.0A	+24V/1.0A	+12V/1.0A	-12V/1.0A
GRN-45-4004	+5.0V/5.0A	+24V/1.0A	+15V/1.0A	-15V/1.0A
GRN-45-3001	+5.0V/5.0A		+12V/1.0A	-12V/1.0A
GRN-45-3002	+5.0V/5.0A		+15V/1.0A	-15V/1.0A
GRN-45-2001	+5.0V/5.0A	+24V/1.0A		
GRN-45-2002	+5.0V/5.0A	+12V/2.0A		
GRN-45-2003	+12V/2.0A	-12V/2.0A		
GRN-45-2004	+15V/2.0A	-15V/2.0A		

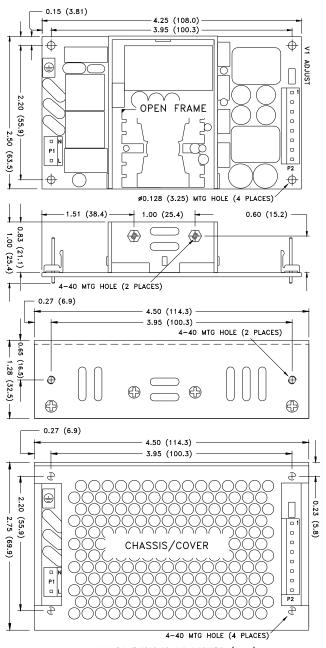
ORDERING INFORMATION

Consult factory for alternate output configurations. Consult factory for positive, negative or floating outputs.(14) Please specify the following optional features when ordering:

CH - Chassis OVP - Overvoltage Protection CO - Cover I/O - Isolated Outputs (consult factory)

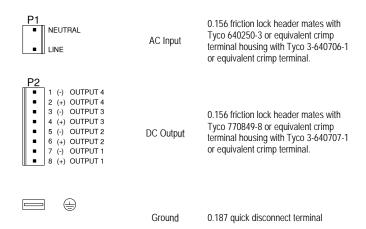
All specifications are maximum at 25°C/45W unless otherwise stated, may vary by model and are subject to change without notice.

	GKIN-	40	
OUTP	PUT SPECIF	ICATION	IS
Output Power at 50°C ₍₁₎	45W	85-264 Vin	
(See Derating Chart) Voltage Centering	Output 1:	±0.5%	
	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)
Source Regulation	Outputs 2 - 4: Outputs 1 - 4:	±5.0% 0.5%	(10-100% load change)
Cross Regulation	Outputs 1 - 4:	5.0%	
Ripple & Noise	Outputs 1 - 4	1.0%	
Turn On Overshoot	<1%		
Transient Response			f initial set point due to a
		hange, 500µS	maximum, 4% maximum
Overvoltage Protection	deviation.	1 hotwoon 11	0% and 150% of rated outp
Overvollage Protection	voltage (optiona		0 % and 150 % of faled outp
Overpower Protection			on/off, auto recovery
Hold-Up Time	16ms typical, ful	power, 115V	input
Start-Up Time	1 sec., 115/230\	/ input	
Output Rise Time	25ms typical		
Minimum Load(5)	No minimum loa	d required	`
	JT SPECIFI	CATIONS	
Protection Class Source Voltage	85 – 264 VAC (s	ee derating ch	art)
Frequency Range	47 – 63 Hz	cc ucrating on	iaity
Input Protection(6)		delay fuse, 15	00A breaking capacity
Peak Inrush Current	50A max. at 230		3 1 3
Peak Efficiency	86%		
Average Efficiency	85% (Avg. of 25	%, 50%, 75%,	and 100% rated load)
Light Load Efficiency	85%, 115/230 V	м, 33% power	
No Load Input Power	<1W, 115/230 V MENTAL SF		TIONS
Cooling	Free air convect		TIONS
Ambient Operating	0°C to + 70°C	1011	
Temperature Range	Derating: see po	wer rating cha	rt
Ambient Storage Temp. Range	- 40°C to + 85°C		
Operating Relative Humidity Range			
Altitude	10,000 ft. ASL	Operating	
Tamparatura Caefficient	40,000 ft. ASL	Non-operatir	ng
Temperature Coefficient Vibration	0.02%/°C	7 2000 4 7 1 0	ctave/min, 3 axis, 1 hour eac
Shock	20G, 11 ms, 3 a	xis 3 each dire	ctave/min, 3 axis, 1 nour eac
	RAL SPECI		
Means of Protection			
Primary to Secondary	2MOPP (Means	of Patient Prof	tection)
Primary to Ground	1MOPP (Means		
Secondary to Ground	Operational Insu	llation(Consult	tactory for 1M()()D or 1M()L
Dielectric Strength(8, 9)			lactory for fividor or fividi
	5656 VDC Prim	ary to Second:	
Reinforced Insulation Basic Insulation	5656 VDC, Prim 2121 VDC, Prim	,	
Reinforced Insulation Basic Insulation Operational Insulation	5656 VDC, Prim 2121 VDC, Prim 707 VDC, Seco	ary to Ground	ary
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current	2121 VDC, Prim 707 VDC, Seco	ary to Ground ondary to Grou	ary
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage	2121 VDC, Prim 707 VDC, Seco	ary to Ground ondary to Grou 000µA SFC	ary
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current	2121 VDC, Prim 707 VDC, Seco <300μΑ NC, <10 <100μΑ NC, <50	ary to Ground ondary to Grou 000µA SFC	ary
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency	2121 VDC, Prim 707 VDC, Seco <300μA NC, <10 <100μA NC, <50 100 KHz	ary to Ground ondary to Grou 000µA SFC 00µA SFC	ary nd
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures	2121 VDC, Prim 707 VDC, Secon <300μA NC, <10 <100μA NC, <50 100 KHz >400,000 hours,	ary to Ground ondary to Grou 000µA SFC 00µA SFC MIL-HDBK-21	ary nd 7F, 25° C, GB
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight	2121 VDC, Prim 707 VDC, Secon <300μA NC, <10 <100μA NC, <50 100 KHz >400,000 hours, 0.48 lbs. Op	ary to Ground ondary to Grou 000µA SFC 00µA SFC MIL-HDBK-21 en frame / 0.62	nd 7F, 25° C, GB 2 lbs. Chassis and cover
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight EMC SPECIFICATION	2121 VDC, Prim 707 VDC, Secon <300μA NC, <10 <100μA NC, <50 100 KHz >400,000 hours, 0.48 lbs. Op	ary to Ground ondary to Grou 2000μΑ SFC 200μΑ SFC MIL-HDBK-21 en frame / 0.62 -2:2014, 4 TH	7F, 25° C, GB 2 lbs. Chassis and cover ed./IEC 61000-6-2:200
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field	2121 VDC, Prim 707 VDC, Seco <300μA NC, <1 <100μA NC, <5 100 KHz >400,000 hours, 0.48 lbs. Op S (IEC 60601-1	ary to Ground ondary to Ground 200µA SFC 200µA SFC MIL-HDBK-21 en frame / 0.62 -2:2014, 4 TH ±8KV contai	7F, 25° C, GB
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts	2121 VDC, Prim 707 VDC, Seco <300μA NC, <11 <100μA NC, <51 100 KHz >400,000 hours, 0.48 lbs. Op S (IEC 60601- EN 61000-4-2 EN 61000-4-3 EN 61000-4-4	ary to Ground ondary to Grou 200µA SFC 200µA SFC MIL-HDBK-21 en frame / 0.62 -2:2014, 4 TH ±8KV contar 80MHz-2.7G ±2 KV, 5KH	7F, 25° C, GB 2 lbs. Chassis and cover ed./IEC 61000-6-2:200; ct / ±15KV air discharge GHz, 10V/m, 80% AM z/100KHz
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity	2121 VDC, Prim 707 VDC, Seco <300μA NC, <11 <100μA NC, <51 100 KHz >400,000 hours, 0.48 lbs. Op S (IEC 60601- EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5	ary to Ground ondary to Ground 2000µA SFC 200µA SFC MIL-HDBK-21 en frame / 0.62 +2:2014, 4 TH ±8KV contar 80MHz-2.7G ±2 KV, 5KH ±2 KV line to	7F, 25° C, GB 2 lbs. Chassis and cover ed./IEC 61000-6-2:200 ct / ±15KV air discharge GHz, 10V/m, 80% AM z/100KHz o earth / ±1 KV line to line
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity	2121 VDC, Prim 707 VDC, Seco <300μA NC, <11 <100μA NC, <51 100 KHz >400,000 hours, 0.48 lbs. Op S (IEC 60601- EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6	ary to Ground ondary to Ground 2000µA SFC 200µA SFC MIL-HDBK-21 en frame / 0.62 +2:2014, 4 TH ±8KV contar 80MHz-2.7G ±2 KV, 5KH ±2 KV line to 0.15 to 80MM	7F, 25° C, GB 2 lbs. Chassis and cover ed./IEC 61000-6-2:200 ct / ±15KV air discharge GHz, 10V/m, 80% AM z/100KHz o earth / ±1 KV line to line Hz, 10V, 80% AM
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	2121 VDC, Prim 707 VDC, Seco <300μA NC, <11 <100μA NC, <51 100 KHz >400,000 hours, 0.48 lbs. Op S (IEC 60601- EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	ary to Ground ondary to Ground 2000µA SFC 200µA SFC MIL-HDBK-21 en frame / 0.62 -2:2014, 4 ¹¹ ±8KV contain 80MHz-2.7G ±2 KV, 5KH ±2 KV line to 0.15 to 80MI 30A/m, 60 H	ary 7F, 25° C, GB 2 lbs. Chassis and cover ed./IEC 61000-6-2:2009 ct / ±15KV air discharge SHz, 10V/m, 80% AM z/100KHz to earth / ±1 KV line to line Hz, 10V, 80% AM lz.
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity	2121 VDC, Prim 707 VDC, Seco <300μA NC, <11 <100μA NC, <51 100 KHz >400,000 hours, 0.48 lbs. Op S (IEC 60601- EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6	ary to Ground ondary to Ground 2000µA SFC 200µA SFC 200µA SFC 222014, 4 TH ±8KV contains 80MHz-2.7G ±2 KV, 5KH ±2 KV line to 0.15 to 80MM 30A/m, 60 H 0% Ur, 0.5 co	7F, 25° C, GB 2 lbs. Chassis and cover ed./IEC 61000-6-2:2003 ct / ±15KV air discharge GHz, 10V/m, 80% AM z/100KHz 0 earth / ±1 KV line to line Hz, 10V, 80% AM Iz. cycles, 0-315° 100/240V A
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	2121 VDC, Prim 707 VDC, Seco <300μA NC, <11 <100μA NC, <51 100 KHz >400,000 hours, 0.48 lbs. Op S (IEC 60601- EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	ary to Ground ondary to Ground ondary to Ground O00µA SFC O0µA SFC O0µA SFC O10µA SFC O10µA SFC O10µA SFC O10µA O1	7F, 25° C, GB 2 lbs. Chassis and cover ed./IEC 61000-6-2:200. ct / ±15KV air discharge GHz, 10V/m, 80% AM z/100KHz 0 earth / ±1 KV line to line Hz, 10V, 80% AM Iz. cycles, 0-315° 100/240V A cles, 0° 100/240V A
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	2121 VDC, Prim 707 VDC, Seco <300μA NC, <11 <100μA NC, <51 100 KHz >400,000 hours, 0.48 lbs. Op S (IEC 60601- EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	ary to Ground ondary to Ground ondary to Ground O00µA SFC O00µA SFC MIL-HDBK-21 en frame / 0.62 = 2:2014, 4 TH ±8KV contar 80MHz-2.76 ±2 KV, 5KH ±2 KV line to 0.15 to 80MI 30A/m, 60 H 0% U _T , 1 c, 5 c 0% U _T , 1 c, 70% U _T , 25/ 70% U _T , 25/ 70% U _T , 25/	7F, 25° C, GB 2 lbs. Chassis and cover ed./IEC 61000-6-2:2003 ct / ±15KV air discharge GHz, 10V/m, 80% AM z/100KHz 0 earth / ±1 KV line to line Hz, 10V, 80% AM lz. cycles, 0° 100/240V A 12 cycles, 0° 100/240V A 12 cycles, 0° 100/240V B 30 cycles, 0° 100/240V B
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips	2121 VDC, Prim 707 VDC, Seco <300μA NC, <11 <100μA NC, <51 100 KHz >400,000 hours, 0.48 lbs. Op S (IEC 60601- EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	ary to Ground ondary to Ground ondary to Ground O00µA SFC O0µA SFC O0µA SFC O10µA SFC	7F, 25° C, GB 2 lbs. Chassis and cover ed./IEC 61000-6-2:2003 ct / ±15KV air discharge GHz, 10V/m, 80% AM z/100KHz 0 earth / ±1 KV line to line Hz, 10V, 80% AM lz. cycles, 0° 100/240V A 12 cycles, 0° 100/240V A 12 cycles, 0° 100/240V B 30 cycles, 0° 100/240V B
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips Voltage Interruptions Radiated Emissions	2121 VDC, Prim 707 VDC, Seco <300μA NC, <11 <100μA NC, <51 100 KHz >400,000 hours, 0.48 lbs. Op S (IEC 60601- EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-1 EN 61000-4-11 EN 61000-4-11	ary to Ground ondary to Ground ondary to Ground O00µA SFC MIL-HDBK-21 en frame / 0.62 -2:2014, 4 TH ±8KV contar 80MHz-2.7G ±2 KV, 5KH ±2 KV line to 0.15 to 80MI 30A/m, 60 H 0% U _T , 0.5 c 0% U _T , 1 cy 40% U _T , 10/ 70% U _T , 25/ 0% U _T , 300 Class B	7F, 25° C, GB 2 lbs. Chassis and cover ed./IEC 61000-6-2:2003 ct / ±15KV air discharge GHz, 10V/m, 80% AM z/100KHz 0 earth / ±1 KV line to line Hz, 10V, 80% AM lz. cycles, 0° 100/240V A 12 cycles, 0° 100/240V A 12 cycles, 0° 100/240V B 30 cycles, 0° 100/240V B
Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Switching Frequency Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips	2121 VDC, Prim 707 VDC, Seco <300μA NC, <10 <100μA NC, <50 100 KHz >400,000 hours, 0.48 lbs. Op S (IEC 60601-1 EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-8 EN 61000-4-11	ary to Ground ondary to Ground ondary to Ground ondary to Ground OOOµA SFC MIL-HDBK-21 en frame / 0.62 -2:2014, 4 TH ±8KV conta: 80MHz-2.7C ±2 KV, 5KH ±2 KV line to 0.15 to 80Mi 30A/m, 60 H 0% UT, 0.50 0% UT, 10/ 70% UT, 25/ 0% UT, 300	7F, 25° C, GB 2 lbs. Chassis and cover ed./IEC 61000-6-2:2003 ct / ±15KV air discharge GHz, 10V/m, 80% AM z/100KHz 0 earth / ±1 KV line to line Hz, 10V, 80% AM lz. cycles, 0° 100/240V A 12 cycles, 0° 100/240V A 12 cycles, 0° 100/240V B 30 cycles, 0° 100/240V B



ALL DIMENSIONS IN INCHES (mm)

CONNECTOR SPECIFICATIONS

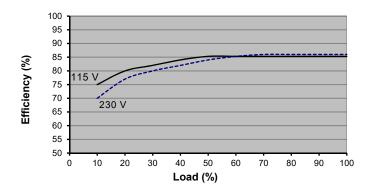


APPLICATIONS INFORMATION

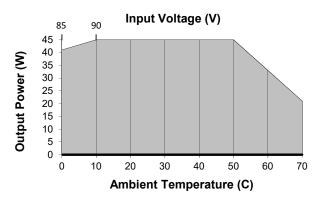
- 1. Each output can deliver its rated current but Total Output Power must not exceed 45W.
- Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature
- Sufficient area 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.
- This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-1:2005, a second fuse may be required in neutral conductor of the end product.
- 7. 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 IEC60601-1:2005. 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 type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 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
- Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
- 11. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to operating instructions for additional information.
- 12. 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.
- 13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
- 14. Optional Output Configuration (consult factory).
 - V2 can be configured positive, negative or floating with respect to V1.
 - V3 can be configured positive or floating with respect to V1 and must share a common return
 - V4 can be configured negative or floating with respect to V1 and must share a common return with V3.

TYPICAL EFFICIENCY vs. LOAD

(Model GRN-45-3001 Efficiency shown)



MAX Pout vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements - Derate from 100% load at 50°C to 50% load at 70°C. - Derate from 100% load at 90Vin to 90% load at 85Vin.

- Compact 2.0" x 3.0" x 1.0" Size
- 3 Year Warranty
- · Universal 85-264V Input
- · Single Output
- 90% Peak Efficiency
- 87% Average Efficiency
 <300mW No Load Input Power
- 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 0-70°C Operating Temperature
- **RoHS Compliant**
- Optional Chassis/Cover





CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

	SAFETT SPEC	IFICATIONS
c FLL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2 nd Edition IEC 60601-1:2005/A1:2012
c 711 us	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
SUD SUD	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING			
MODEL	OUTPUT	Роит	
GRN-60-1001	3.3V/9.0A	30W	
GRN-60-1002	5.0V/9.0A	45W	
GRN-60-1003	12V/5.0A	60W	
GRN-60-1004	15V/4.0A	60W	
GRN-60-1005	24V/2.5A	60W	
GRN-60-1006	28V/2.2A	60W	
GRN-60-1007	48V/1.3A	60W	
GRN-60-1008	19V/3.1A	60W	

ORDERING INFORMATION

Consult factory for alternate output configurations. Please specify the following optional features when ordering:

CH - Chassis OVP - Overvoltage Protection CO - Cover DF - Dual Fuse

	GKI	N-6U			
OUTPUT SPECIFICATIONS					
Output Power at 50°C ₍₁₎	60W	85-264 V _{IN}			
(See Derating Chart)	0.50/	(0.1.1.1500/1.1)			
Voltage Centering	±0.5%	(Output at 50% load)			
Voltage Adjust Range	95-105%	(
Load Regulation	±0.5%	(0-100% load change)			
Source Regulation	0.5%				
Ripple & Noise	1.0%	<150mV (1001,1002)			
Turn-On Overshoot	None				
Transient Response		vers to within 1% of initial set point due to a			
		ad change, 500µs maximum, 5% maximum naximum deviation on 1001: 8%, 1002: 6%).			
Overvoltage Protection		etween 110% and 150% of rated output			
-	voltage (opti	,			
Overpower Protection		ated Pour min., cycle on/off, auto recovery			
Hold-Up Time	10ms typica	I, full power, 115V input			
Start-Up Time	1 sec., 115/2	230V input			
Output Rise Time	27ms typica	I			
Minimum Load		n load required			
ll l	NPUT SPEC	IFICATIONS			
Protection Class	I				
Source Voltage	85 – 264 VA	AC (see derating chart)			
Frequency Range	47 – 63 Hz				
Input Protection ₍₅₎	Internal 2A t	time-delay fuse, 1500A breaking capacity			
Peak Inrush Current	50A max. at	230 V			
Poak Efficiency	00%				

Peak Efficiency	90%
Average Efficiency	87% (1003-1008), 85% (1002), 80% (1001)
Light Load Efficiency	85%, 115/230 V _{IN} , 33% power, 81% (1001), 84% (1002)
No Load Input Power	<0.3W, 115/230 V _N , no load
ENVIRON	MENTAL SPECIFICATIONS
Cooling	Free air convection
Ambient Operating	0° to + 70°C
Temperature Range	Derating: see power rating chart
Ambient Storage Temp. Range	- 40° to + 85°C
Operating Relative Humidity Range	20-90% non-condensing
Altitude	10,000 ft. ASL Operating

40,000 ft. ASL Non-operating Temperature Coefficient 0.02%/°C Vibration 2.5G swept sine, 7-2000Hz, 1 octave/min, 3 axis, 1 hour each.

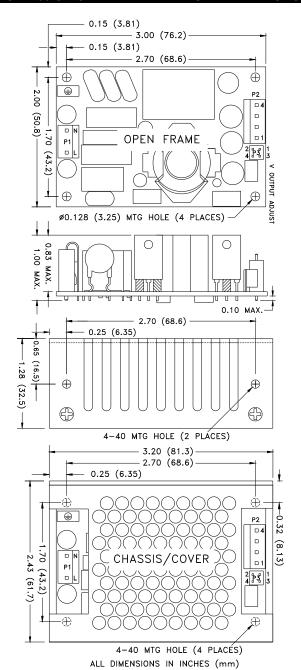
Shock 20G, 11ms, 3 axis, 3 each direction. **GENERAL SPECIFICATIONS**

Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOPP (Means of Patient Protection)
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength _(7, 8)	
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
Switching Frequency	65 KHz
Remote Sense(9)	400 mV compensation of output cable losses
Mean-Time Between Failures	>250,000 hours, MIL-HDBK-217F, 25° C, GB
Weight	0.24 lbs. Open frame/0.34 lbs. Chassis and cover

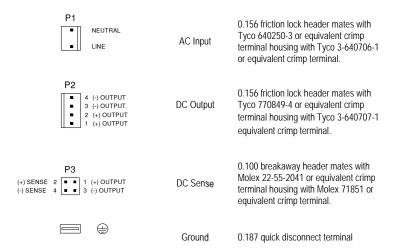
EMC SPECIFICATION	S (IEC 60601-1	-2:2014, 4 TH ed./IEC 61000-6-2:200	05)
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge	Α
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM	Α
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz	Α
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to line	Α
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM	Α
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.	Α
Voltage Dips	EN 61000-4-11	0% U _T , 0.5 cycles, 0-315° 100/240V	A/A
		0% U _T , 1 cycles, 0° 100/240V	A/A
		40% U _T , 10/12 cycles, 0° 100/240V I	B/A
		70% U _T , 25/30 cycles, 0° 100/240V I	B/A
Voltage Interruptions	EN 61000-4-11	0% U _T , 300 cycles, 0° 100/240V I	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/60W unless otherwise stated, may vary by model and are subject to change without notice.





CONNECTOR SPECIFICATIONS

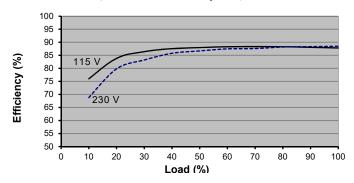


APPLICATIONS INFORMATION

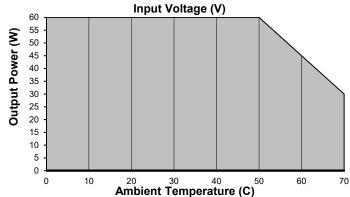
- Continuous Output Power must not exceed 60W.
- Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
- Sufficient area must be provided around power supply to allow 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.
- Standard models include only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-1:2005, a second fuse may be required in neutral conductor of the end product. Models with the suffix DF include a fuse in the line and neutral leads.
- 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.
- 7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1:2005. 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 type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 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 400mV, depending on model. The use of a twisted pair, decoupling capacitors and an appropriatelyrated low-impedance capacitor connected across the load will increase noise immunity.
- 10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
- 11. 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.

TYPICAL EFFICIENCY vs. LOAD

(Model GRN-60-1004 efficiency shown)



MAX POUT VS. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements - Derate from 100% load at 50°C to 50% load at 70°C.

- Compact 2.5" x 4.25" x 1.0" Size
- 3 Year Warranty Universal 85-264V Input
- Single Output
- 89% Peak Efficiency
- 87% Average Efficiency
- <300mW No Load Input Power
- 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 • 0-70°C Operating Temperature
- RoHS Compliant
- · Optional Chassis/Cover





CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c FL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c FLL us	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	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive	(2014/35/EU of February 2014)

	MODEL LISTING	
MODEL	OUTPUT	P _{OUT}
GRN-80-1001	3.3V/16A	53W
GRN-80-1002	5.0V/16A	80W
GRN-80-1003	12V/6.7A	W08
GRN-80-1004 GRN-80-1005	15V/5.3A 24V/3.3A	80W 80W
GRN-80-1005	28V/2.9A	80W
GRN-80-1007	48V/1.7A	80W

ORDERING INFORMATION

Consult factory for alternate output configurations. Please specify the following optional features when ordering:

CH - Chassis CO - Cover

OVP - Overvoltage Protection

	GRN-	<u> </u>	
OUTP	UT SPECIF	ICATIONS	
Output Power at 50°C ₍₁₎	80W	85-264 Vin	
(See Derating Chart)			
Voltage Centering	±0.5%	(Output at 50% load)	
Voltage Adjust Range	95-105%		
Load Regulation	±0.5%	(0-100% load change)	
Source Regulation	0.5%		
Ripple & Noise	1.0%	(1001 & 1002<3%)	
Turn On Overshoot	None		
Transient Response	Output recovers	to within 1% of initial set point due to a	
		nange, 500µS maximum, 5% maximum	
	deviation. (maxin	num deviation on 1001-8%, 1002-6%)	
Overvoltage Protection		en 110% and 150% of rated output	
	voltage (optional)		
Overpower Protection	110% rated Pour	min, cycle on/off, auto recovery	
Hold-Up Time		power, 115V input	
Start-Up Time	1 sec., 115/230V	input	
Output Rise Time	50ms typical		
Minimum Load	No minimum load		
INPU	T SPECIFIC	CATIONS	
Protection Class	1		
Source Voltage	85 – 264 VAC (se	ee derating chart)	
Frequency Range	47 – 63 Hz		
Input Protection(5)	Internal 3A time delay fuse, 1500A breaking capacity		
Peak Inrush Current	50A max. at 230 V		
Peak Efficiency	89%, 115/230 Vin, 100% power (1001>84%) (1002>87%)		
Average Efficiency	87% (1003-1007), 85% (1002), 82% (1001)		
Light Load Efficiency	85%, 115/230 V _{IN} , 33% power (1001>81%) (1002>84%)		
No Load Input Power	<0.3W/ 115/230 VI	Vin, no load (1001<0.5W)	
		ECIFICATIONS	
	Free air convection		
Cooling Ambient Operating	0°C to + 70°C	UII	
		war rating abort	
Temperature Range	Derating: see por		
Ambient Storage Temp. Range	- 40°C to + 85°C		
Operating Relative Humidity Range			
Altitude	10,000 ft. ASL	Operating	
	40,000 ft. ASL	Non-operating	
Temperature Coefficient	0.02%/°C	7.000011 4 1 1 1 7 1 1 1 1	
Vibration	2.5G swept sine,	7-2000Hz, 1 octave/min, 3 axis, 1 hour eac	
Shock		kis, 3 each direction.	
GENER	RAL SPECII	FICATIONS	
Means of Protection			
Primary to Secondary	2MOPP (Means	of Patient Protection)	
Primary to Ground		of Patient Protection)	
Secondary to Ground		lation(Consult factory for 1MOOP or 1MOF	
Dielectric Strength(7, 8)		,	
Reinforced Insulation	5656 VDC, Prima	ary to Secondary	
Basic Insulation	2121 VDC, Prima	,	
Operational Insulation		ndary to Ground	
Leakage Current		-	
Earth Leakage	<300µA NC, <10	000µA SFC	
Touch Current			
	<300μA NC, <10 <100μA NC, <50		

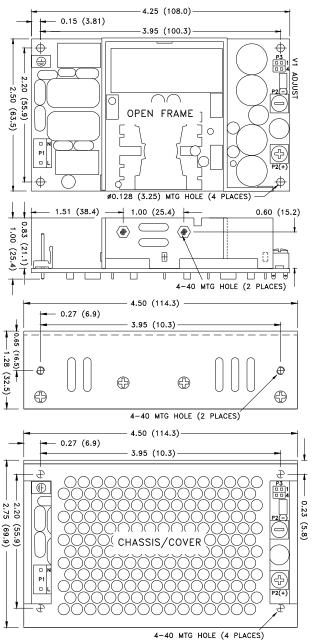
2MOPP (Means of Patient Protection)		
1MOPP (Means of Patient Protection)		
Operational Insulation(Consult factory for 1MOOP or 1MOPP)		
5656 VDC, Primary to Secondary		
2121 VDC, Primary to Ground		
707 VDC, Secondary to Ground		
<300μA NC, <1000μA SFC		
<100µA NC, <500µA SFC		
65 KHz		
400 mV compensation of output cable losses		
>250,000 hours, MIL-HDBK-217F, 25° C, GB		
0.43 lbs. Open frame / 0.56 lbs. Chassis and cover		

Worgin	0.10105.	port frame / 0.00 lbs. Onassis and cov	O.
EMC SPECIFICATION	IS (IEC 60601-	1-2:2014, 4 TH ed./IEC 61000-6-2:200	05)
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge	Α
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM	Α
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz	Α
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to line	Α
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM	Α
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.	Α
Voltage Dips	EN 61000-4-11	0% U _T , 0.5 cycles, 0-315° 100/240V	A/A
		0% U _T , 1 cycles, 0° 100/240V	A/A
		40% U _T , 10/12 cycles, 0° 100/240V	B/A
		70% U _T , 25/30 cycles, 0° 100/240V	B/A
Voltage Interruptions	EN 61000-4-11	0% U _T , 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/80W unless otherwise stated, may vary by model and are subject to change without notice.



GRN-80 SINGLE MECHANICAL SPECIFICATIONS



ALL DIMENSIONS IN INCHES (mm)

CONNECTOR SPECIFICATIONS

P1 0.156 friction lock header mates with NEUTRAL Tyco 640250-3 or equivalent crimp AC Input LINE terminal housing with Tyco 3-640706-1 or equivalent crimp terminal. P2 6-32 screw down terminal mates with DC Output #6 ring tongue terminal (10in-lb Max.) **(4)** (-) OUTPUT (+) OUTPUT

P3 (-) SENSE 2 (+) SENSE Remote Sense 0.100 breakaway header mates with Molex 22-55-2041 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal

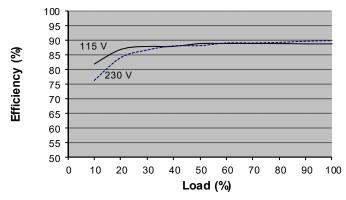
0.187 quick disconnect terminal Ground

APPLICATIONS INFORMATION

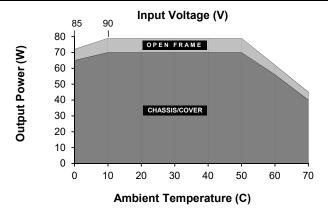
- Continuous Output Power must not exceed 80W.
- 2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
- Sufficient area must be provided around power supply to 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.
- This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-1:2005, a second fuse may be required in neutral conductor of the end product.
- 6. 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
- 7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1:2005. 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 type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 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 400mV, depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated lowimpedance capacitor connected across the load will increase noise immunity
- 10. 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.
- 12. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.

TYPICAL EFFICIENCY vs. LOAD

(Model GRN-80-1004 Efficiency shown)



MAX Pout vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements - Derate from 100% load at 50°C to 50% load at 70°C.

- Derate from 100% load at 90Vin to 90% load at 85Vin.
- Derate 10% with chassis and cover.

- Compact 3.0" x 5.0" x 1.0" Size
- 3 Year Warranty
- Universal 85-264V Input
- Dual, Triple or Quad Outputs
- 87% Peak Efficiency
- 85% Average Efficiency
- <1W No Load Input Power
- IEC 60601-1 3rd ed. Medical Cert. IEC 60950-1 2nd ed. ITE Certification IEC 60601-2 4th ed. EMC
- Class B Emissions per EN55011/32
- 0-70°C Operating Temperature RoHS Compliant
- Optional Chassis/Cover





CHASSIS/COVER

OPEN FRAME

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

MODEL LISTING				
MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
GRN-80-4001	+3.3V/8.0A	+5.0V/5.0A	+12V/1.5A	-12V/1.5A
GRN-80-4002	+5.0V/8.0A	-5.0V/5.0A	+12V/1.5A	-12V/1.5A
GRN-80-4003	+5.0V/8.0A	+24V/1.0A	+12V/1.5A	-12V/1.5A
GRN-80-4004	+5.0V/8.0A	+24V/1.0A	+15V/1.5A	-15V/1.5A
GRN-80-3001	+5.0V/8.0A		+12V/2.0A	-12V/2.0A
GRN-80-3002	+5.0V/8.0A		+15V/2.0A	-15V/2.0A
GRN-80-2001	+5.0V/8.0A	+24V/2.0A		
GRN-80-2002	+5.0V/8.0A	+12V/4.0A		
GRN-80-2003	+12V/4.0A	-12V/4.0A		
GRN-80-2004	+15V/3.0A	-15V/3.0A		

ORDERING INFORMATION

Consult factory for alternate output configurations. Consult factory for positive, negative or floating outputs.(13)

Please specify the following optional features when ordering:

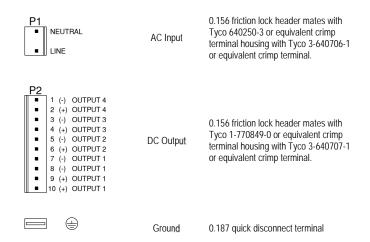
CH - Chassis OVP - Overvoltage Protection I/O - Isolated outputs CO - Cover

	QIVIN-	00	
OUTI	PUT SPECIF	ICATIONS	
Output Power at 50°C ₍₁₎	80W	85-264 Vin	
(See Derating Chart) Voltage Centering	Output 1:	±0.5%	
voltage Centering	Output 1.	±5.0% (All ou	tputs at 50% load)
Voltage Adjust Range	Output 1:	95-105%	
Load Regulation	Output 1:		% load change)
	Outputs 2 - 4:		10% load change)
Source Regulation	Outputs 1 - 4:	0.5%	
Cross Regulation	Outputs 2 - 4:	5.0%	
Ripple & Noise Turn On Overshoot	Outputs 1 - 4 <1%	1.0%	
Transient Response		to within 1% of initial se	t point due to a
Transient response	50% step load c deviation.	hange, 500µS maximun	n, 4% maximum
Overvoltage Protection	voltage (optiona		·
Overpower Protection		ed Pout, cycle on/off, au	to recovery
Hold-Up Time		l power, 115V input	
Start-Up Time Output Rise Time	1 sec., 115/230\ 25ms typical	riiiput	
Minimum Load(5)	No minimum loa	d required	
	UT SPECIFI		
Protection Class			
Source Voltage		ee derating chart)	
Frequency Range	47 – 63 Hz		
Input Protection(6)		delay fuse, 1500A break	king capacity
Peak Inrush Current	50A max. at 230 87%	V	
Peak Efficiency Average Efficiency		%, 50%, 75% and 100%	rated lead)
Light Load Efficiency	85%, 115/230 V		rateu loau)
No Load Input Power	<1W, 115/230 V		
		ECIFICATIONS	
Cooling	Free air convect		
Ambient Operating	0°C to + 70°C		
Temperature Range	Derating: see po		
Ambient Storage Temp. Range	- 40°C to + 85°C		
Operating Relative Humidity Range			
Altitude	10,000 ft. ASL	Operating	
Temperature Coefficient	40,000 ft. ASL 0.02%/°C	Non-operating	
Vibration		7-2000Hz, 1 octave/min	3 axis 1 hour each
Shock	20G, 11ms, 3 ax	is, 3 each direction.	, , , , , , , , , , , , , , , , , , , ,
GENE	RAL SPECI	FICATIONS	
Means of Protection			
Primary to Secondary		of Patient Protection)	
Primary to Ground Secondary to Ground		of Patient Protection) lation(Consult factory fo	r 1MOOD or 1MODE
Dielectric Strength(8, 9)	Operational insc	iation(Consult factory to	I INIOCI OI INIOI I
Reinforced Insulation	5656 VDC, Prim	ary to Secondary	
Basic Insulation	2121 VDC, Prim		
Operational Insulation	707 VDC, Seco	ondary to Ground	
Leakage Current	200* *10*	2004 CEC	
Earth Leakage Touch Current	<300µA NC, <1		
Switching Frequency	<100µA NC, <5 100 KHz	лори эт С	
Mean-Time Between Failures		MIL-HDBK-217F, 25° C	C, GB
Weight		en frame / 0.80 lbs. Cha	
EMC SPECIFICATIONS			
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15K\	/ air discharge /
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/r	
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz	
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±	
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 8	
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.	215° 100/240\/ A/
Voltage Dips	EN 61000-4-11	$0\% \ U_T$, 0.5 cycles, 0-3 $0\% \ U_T$, 1 cycles, 0° $40\% \ U_T$, 10/12 cycles	100/240V A/A
		70% U _T , 25/30 cycles	, 0° 100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U _T , 300 cycles, 0°	
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/80W unless otherwise stated, may vary by model and are subject to change without notice.

ALL DIMENSIONS IN INCHES (mm) **CONNECTOR SPECIFICATIONS**

4-40 MTG HOLE (4 PLACES)

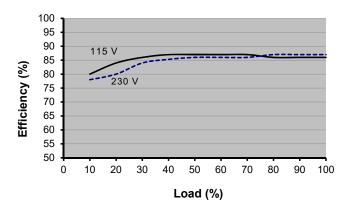


APPLICATIONS INFORMATION

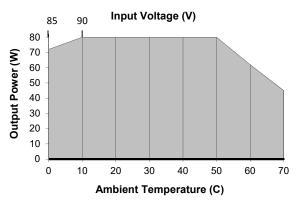
- Each output can deliver its rated current but Total Output Power must not exceed 80W.
- 2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
- 3. Sufficient 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.
- 5. 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.
- This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-1:2005, a second fuse may be required in neutral conductor of the end product.
- 7. 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
- 8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1:2005. 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 type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 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.
- Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
- 11. 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.
- 12. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
- 13. Optional Output Configuration (consult factory).
 - V2 can be configured positive, negative or floating with respect to V1.
 - V3 can be configured positive or floating with respect to V1.
 - V4 can be configured positive, negative or floating with respect to V1.

TYPICAL EFFICIENCY vs. LOAD

(Model GRN-80-3001 Efficiency shown)



MAX POUT VS. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements - Derate from 100% load at 50°C to 50% load at 70°C. - Derate from 100% load at 90VIN to 90% load at 85VIN.

- Compact 3.0" x 5.0" x 1.25" Size
- 3 Year Warranty Universal 85-264V Input
- Single Output
- 90% Peak Efficiency
- 87% Average Efficiency
- <300mW No Load Input Power
- 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 • 0-70°C Operating Temperature
- RoHS Compliant
- · Optional Chassis/Cover





CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

. 71 .us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME	File E 137700/E 140239	CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c 911 us	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	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/FU of June 2011)

MODEL LISTING				
MODEL	OUTPUT	Роит		
GRN-110-1001 GRN-110-1002 GRN-110-1003	3.3V/22A 5.0V/22A 12V/9.2A	73W 110W 110W		
GRN-110-1003 GRN-110-1004 GRN-110-1005 GRN-110-1006	15V/7.3A 24V/4.6A 28V/3.9A	110W 110W 110W		
GRN-110-1007	48V/2.3A	110W		

ORDERING INFORMATION

Consult factory for alternate output configurations. Please specify the following optional features when ordering:

CH - Chassis CO - Cover

OVP - Overvoltage Protection

(CDN 110		
	GRN-110		
OUTP	UT SPECIFICATIONS		
Output Power at 50°C ₍₁₎	110W 85-264 V _{IN}		
(See Derating Chart)			
Voltage Centering	±0.5% (Output at 50% load)		
Voltage Adjust Range	95-105%		
Load Regulation	±0.5% (0-100% load change)		
Source Regulation	0.5%		
Ripple & Noise	1.0% (1001, 1002 < 3%)		
Turn On Overshoot	None		
Transient Response	Output recovers to within 1% of initial set point due to a 50% step load change, 500µS maximum, 5% maximum deviation. (maximum deviation on 1001-8%, 1002-6%)		
Overvoltage Protection	Latching, Between 110% and 150% of rated output voltage (optional)		
Overpower Protection	110% rated Poυτ min, cycle on/off, auto recovery		
Hold-Up Time	16ms typical, full power, 115V input		
Start-Up Time	1 sec., 115/230V input		
Output Rise Time	50ms typical		
Minimum Load	No minimum load required		
INPU	IT SPECIFICATIONS		
Protection Class			
Source Voltage	85-264 VAC (see derating chart)		
Frequency Range	47-63 Hz		
Input Protection(5)	Internal 4A time delay fuse, 1500A breaking capacity		
Peak Inrush Current	50A max. at 230 V		
Peak Efficiency	90%		
Average Efficiency	87% (1003-1007), 86% (1002), 82% (1001)		
Light Load Efficiency	85%, 115/230 Vin, 33% power (1001 >81%)		
No Load Input Power	<0.3W, 115/230 V _{IN} , no load (1001<0.5W)		
ENVIRONM	MENTAL SPECIFICATIONS		
Cooling	Free air convection		
Ambient Operating	0°C to + 70 C		
Temperature Range	Derating: see derating chart		
Ambient Storage Temp. Range	-40°C to +85°C		
Operating Relative Humidity Range	20-90% non-condensing		
Altitude	10,000 ft. ASL Operating		
Autude	40,000 ft. ASL Non-operating		
Temperature Coefficient	0.02%/°C		
Vibration	2.5G swept sine, 7-2000Hz, 1 octave/min, 3 axis, 1 hour each		
Shock	20G 11 ms, 3 axis, 3 each direction.		
	RAL SPECIFICATIONS		
	TAL OF LOIF ICATIONS		
Means of Protection	2MOPP (Means of Patient Protection)		
Primary to Secondary Primary to Ground	1MOPP (Means of Patient Protection)		
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPF		
	Operational insulation (consult factory for 19100) of 1910) i		
	5656 VDC. Primary to Secondary		
Basic Insulation			
Dielectric Strength _(7, 8) Reinforced Insulation	5656 VDC, Primary to Secondary 2121 VDC, Primary to Ground 707 VDC, Secondary to Ground		

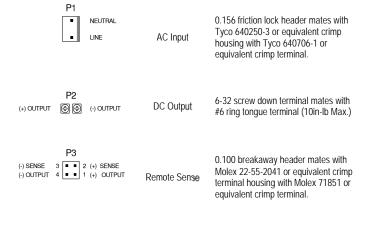
Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOPP (Means of Patient Protection)
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(7, 8)	•
Reinforced Insulation	5656 VDC, Primary to Secondary
Basic Insulation	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
Switching Frequency	65 KHz
Remote Sense ₍₉₎	400 mV compensation of output cable losses
Mean-Time Between Failures	>250,000 hours, MIL-HDBK-217F, 25° C, GB
Weight	0.65 lbs. Open frame / 0.85 lbs. Chassis and cover

3	'		
EMC SPECIFICATION	IS (IEC 60601-1	-2:2014, 4 TH ed./IEC 6100	00-6-2:2005)
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air of	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	Α
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.	А
Voltage Dips	EN 61000-4-11	0% U _T , 0.5 cycles, 0-315°	100/240V A/A
		0% U _T , 1 cycles, 0°	100/240V A/A
		40% U _T , 10/12 cycles, 0°	100/240V B/A
		70% U _T , 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U _T , 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 (<100W P _{IN})	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

All specifications are maximum at 25°C/110W unless otherwise stated, may vary by model and are subject to change without notice.



ALL DIMENSIONS IN INCHES (mm) CONNECTOR SPECIFICATIONS



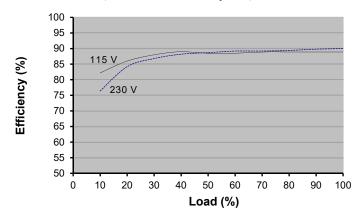
0.187 quick disconnect terminal Ground

APPLICATIONS INFORMATION

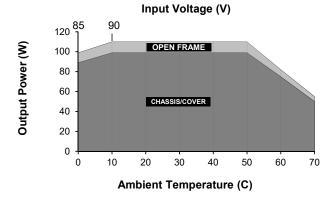
- Continuous Output Power must not exceed 110W.
- 2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
- Sufficient area must be provided around power supply 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.
- This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-1:2005, a second fuse may be required in neutral conductor of the end product.
- 6. 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.
- 7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1:2005. 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 type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 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 400mV, depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated lowimpedance capacitor connected across the load will increase noise immunity
- 10. 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.
- 12. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.

TYPICAL EFFICIENCY vs. LOAD

(Model GRN-110-1004 Efficiency shown)



MAX POUT VS. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements - Derate from 100% load at 50°C to 50% load at 70°C.

- Derate from 100% load at 90VIN to 90% load at 85VIN.
- Derate 10% with chassis and cover.

- Compact 3.0" x 5.0" x 1.25" Size
- 3 Year Warranty
- Universal 85-264V Input
- · Dual, Triple or Quad Outputs
- 87% Peak Efficiency
- 85% Average Efficiency <1W No Load Input Power
- 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
- 0-70°C Operating Temperature
- RoHS Compliant
- · Optional Chassis/Cover





CHASSIS/COVER

OPEN FRAME

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

	MO	ODEL LISTIN	NG	
MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
GRN-110-4001	+3.3V/10A	+5V/5A	+12V/2A	-12V/2A
GRN-110-4002	+5V/10A	-5V/5A	+12V/2A	-12V/2A
GRN-110-4003	+5V/10A	+24V/2A	+12V/2A	-12V/2A
GRN-110-4004	+5V/10A	+24V/2A	+15V/2A	-15V/2A
GRN-110-3001	+5V/12A		+12V/3A	-12V/3A
GRN-110-3002	+5V/12A		+15V/3A	-15V/3A
GRN-110-2001	+5V/12A	+24V/3A		
GRN-110-2002	+5V/12A	+12V/5A		
GRN-110-2003	+12V/5A	-12V/5A		
GRN-110-2004	+15V/4A	-15V/4A		

ORDERING INFORMATION

Consult factory for alternate output configurations. Consult factory for positive, negative or floating outputs.(13) Please specify the following optional features when ordering:

CH - Chassis OVP - Overvoltage Protection CO - Cover I/O - Isolated Outputs

All specifications are maximum at 25°C/110W unless otherwise stated, may vary by model and are subject to change without notice.

CDNI 110

(GRN-1	10
OUTP	UT SPECIF	ICATIONS
Output Power at 50°C ₍₁₎	110W	85-264 Vin
(See Derating Chart)	0.1.11	0.50/
Voltage Centering	Output 1: Outputs 2 - 4:	±0.5% ±5.0% (All outputs at 50% load)
Voltage Adjust Range	Output 1:	95-105%
Load Regulation	Output 1:	±0.5% (0-100% load change)
3.11.	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	Outputs 1 - 4	1.0%
Turn On Overshoot Transient Response	<1%	a within 10/ of initial and an int due to a
Transient Response		to within 1% of initial set point due to a ange, 500µS maximum, 4% maximum
Overvoltage Protection	voltage (optional)	
Overpower Protection		d Pout, cycle on/off, auto recovery
Hold-Up Time		power, 115V input
Start-Up Time Output Rise Time	1 sec., 115/230V 25ms typical	input
Minimum Load(5)	No minimum load	I required
	T SPECIFIC	
Protection Class	 	
Source Voltage	85 – 264 VAC (se	ee derating chart)
Frequency Range	47 – 63 Hz	
Input Protection(6)	Internal 4A time of	lelay fuse, 1500A breaking capacity
Peak Inrush Current	40A max at 230 \	<i>I</i>
Peak Efficiency	87%	/ F00/ 7F0/ d 4000/tdldl
Average Efficiency Light Load Efficiency		6, 50%, 75% and 100% rated load)
No Load Input Power	85%, 115/230 Vin <1W, 115/230 Vin	
ENVIRONM	MENTAL SP	ECIFICATIONS
Cooling	Free air convection	
Ambient Operating	0°C to + 70°C	
Temperature Range	Derating: see pov	ver rating chart
Ambient Storage Temp. Range	- 40°C to + 85°C	
Operating Relative Humidity Range		
Altitude	10,000 ft. ASL	Operating
Taranaratura Caaffalant	40,000 ft. ASL	Non-operating
Temperature Coefficient Vibration	0.02%/°C	7-2000Hz, 1 octave/min, 3 axis, 1 hour each
Shock	20g, 11 ms, 3 axi	
	RAL SPECIF	
Means of Protection	TAL OF LON	IOATIONO
Primary to Secondary	2MOPP (Means of	of Patient Protection)
Primary to Ground	1MOPP (Means	of Patient Protection)
Secondary to Ground	Operational Insul	ation(consult factory for 1MOOP or 1MOPP)
Dielectric Strength(8, 9)	E0E0 VIDO D :	make Occasional
Reinforced Insulation	5656 VDC, Prima 2121 VDC, Prima	
Basic Insulation Operational Insulation	707 VDC, Prima	
Leakage Current	707 400, 06001	.aa., to oroana
Earth Leakage	<300µA NC, <10	00μA SFC
Touch Current	<100µA NC, <50	
Switching Frequency	100 KHz	
Mean-Time Between Failures		MIL-HDBK-217F, 25° C, GB
Weight	0.79 lbs. Ope	n frame / 1.00 lbs. Chassis and cover
EMCSPECIFICATIONS		2:2014, 4 TH ed./IEC 61000-6-2:2005)
Electrostatic Discharge Radiated Electromagnetic Field	EN 61000-4-2	±8KV contact / ±15KV air discharge A
Electrical Fast Transients/Bursts	EN 61000-4-3 EN 61000-4-4	80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz A
Surge Immunity	EN 61000-4-4 EN 61000-4-5	± 2 KV line to earth $/ \pm 1$ KV line to line A
Conducted Immunity	EN 61000-4-5	0.15 to 80MHz, 10V, 80% AM
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.
Voltage Dips	EN 61000-4-11	0% U _T , 0.5 cycles, 0-315° 100/240V A/A
V- F-		0% U _T , 1 cycles, 0° 100/240V A/A
		40% U _T , 10/12 cycles, 0° 100/240V B/A
M 16 1 1 2	EN 04000 : : :	70% U _T , 25/30 cycles, 0° 100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U _T , 300 cycles, 0° 100/240V B/E
Radiated Emissions	EN 55011/32	Class B
Conducted Emissions Harmonic Current Emissions	EN 55011/32 EN 61000-3-2	Class B Class A (<100W P _{IN})
HALLIOTIO CULTOIR EIIIIGGIUIG	LIT U I U U U U U - U - Z	CINCOLA CALCULATION IN INTERPRETATION OF THE CALCULATION OF THE CALCUL

Harmonic Current Emissions Voltage Fluctuations/Flicker

EN 61000-3-2

EN 61000-3-3

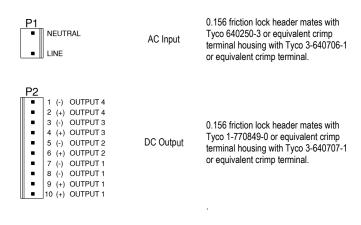
Class A (<100W P_{IN})

Compliant

ALL DIMENSIONS IN INCHES (mm)

4-40 MTG HOLE (4 PLACES)

CONNECTOR SPECIFICATIONS



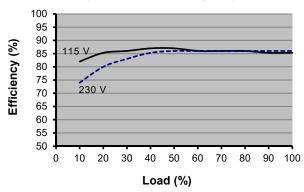
Ground

APPLICATIONS INFORMATION

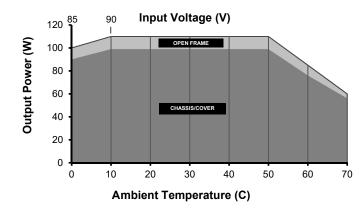
- 1. Each output can deliver its rated current but Total Output Power must not exceed 110W.
- 2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature
- Sufficient 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.
- This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-1:2005, a second fuse may be required in neutral conductor of the end product.
- 7. 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.
- 8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1:2005. 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 type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 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.
- Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
- 11. 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.
- 12. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
- 13. Optional Output Configuration (consult factory).
 - V2 can be configured positive, negative or floating with respect to V1.
 - V3 can be configured positive or floating with respect to V1.
 - V4 can be configured positive, negative or floating with respect to V1.

TYPICAL EFFICIENCY vs. LOAD

(Model GRN-110-3001 Efficiency shown)



MAX Pout vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements - Derate from 100% load at 50°C to 50% load at 70°C.

- Derate from 100% load at 90Vin to 90% load at 85Vin.
- Derate 10% with Chassis/Cover option.

 $(\underline{+})$

0.187 guick disconnect terminal

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
 <300m No Load Input Power
- RoHS Compliant

- IEC 60601-1 3rd ed. Medical Cert.
 IEC 60950-1 2nd ed. ITE Certification
 IEC 62368-1 2nd ed. Certification
 IEC 60601-1-2 4th ed. EMC
 Class B Emissions per EN55011/32
 -20 to +70°C Operating Temperature
 Optional Power Fail Warning
 Optional Chassis/Cover
- Optional Chassis/Cover



CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c 711 us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition UL 62368-1:2014, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2 nd Edition IEC 62368-1:2014, 2 nd Edition IEC 60601-1:2005/A1:2012
c FLL us	UL Recognition Mark for Canada File E137708/E140259	CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition CAN/CSA-C22.2 No. 62368-1-14 CAN/CSA-C22.2 No. 60601-1:2014
TUV	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 62368-1:2014, 2 nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

	M	ODEL LISTII	NG	
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 PF - Power Fail Warning CO - Cover IO - Isolated Outputs BF - Type BF

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

CDNI JOO

	GRN-2	200
	UT SPECIF	
Output Power at 50°C(1)	135W	Convection Cooled, Open Frame
(See Derating Chart)	200W	300LFM Forced Air, Open Frame ₍₁₄₎
Voltage Centering(15)	Output 1: Outputs 2-4:	± 0.5% (all outputs at 50% load)
Voltage Adjust Range	Output 1:	± 5.0% (all outputs at 50% load) 95-105%
Load Regulation	Output 1:	± 0.5% (0-100% load change)
3	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	Outputs 1-4:	1.0% or 100mV p-p, 20MHz BW
Turn on Overshoot Transient Response	None Output recovers	to within 1% of initial set point due to a
Transient Nesponse		o load change, 500µs maximum, 4%
	maximum deviati	ion.
Overvoltage Protection		en 110% and 150% of rated output voltage.
Overpower Protection		Pout, cycle on/off, auto recovery
Hold Up Time	16ms minimum,	
Start Up Time	<1 sec., 115/230	IV Input
Output Rise Time Minimum Load (5)	25ms typical No minimum load	d required
VIII III LOAU (5)	T SPECIFIC	CATIONS
Protection Class		<u>GATIONO</u>
Source Voltage	85 – 264 Volts A	C (see derating chart)
Frequency Range	47 – 63 Hz	
nput Protection		time delay fuses, 1500A breaking capacit
Peak Inrush Current	40A max	
Peak Efficiency	Up to 90%	-1050/ 500/ 750/ 4000/ 111 *
Average Efficiency No Load Input Power		of 25%, 50%, 75%, 100% rated load)
NO LOAU IIIPUL POWEI	<300mW, 115/23	30 V _{IN} , no load 30 V _{IN} , no load (PF Option)
ENVIRONM		PECIFICATIONS
Ambient Operating Temp. Range		, Derating (see derating Chart)
Ambient Storage Temp. Range	- 40°C to + 85°C	
Operating Relative Humidity Range		
Altitude	3,000m ASL Ope	erating
Temperature Coefficient	0.02%/°C	
Vibration (MIL-STD-810G)		10-2000Hz, 1octave/min, 3 axis, 1 hour ea
Shock (MIL-STD-810G)	20G, 11ms, 3 ax	is.
	RAL SPECI	FICATIONS
Means of Protection Primary to Secondary	2MOPP (Means	of Patient Protection)
Primary to Ground		of Patient Protection)
Secondary to Ground		lation (1MOPP w/ Option BF)
Dielectric Strength(7, 8)		, , , , , , , , , , , , , , , , , , , ,
Reinforced Insulation	5656 VDC (4000	
Basic Insulation	2121 VDC (1500	
Operational Insulation	707 VDC (500V	/AC) ₍₁₂₎ /2121VDC(1500VAC) ₍₁₂₎ w/ Option
Leakage Current Earth Leakage	<300µA NC, <10	OOOLIA SEC
Touch Current	<300μA NC, <10 <100μA NC, <50	
Patient Leakage Current		00μA SFC w/Option BF
Power Fail Signal	Logic low with in	put power failure 9ms prior to loss of Out
	1.(13)	
Switching Frequency	PWM:65 KHz/PF	
Remote Sense		sation of output cable losses (output 1)
Mean-Time Between Failures		S, MIL-HDBK-217F, 25° C, GB
Weight		ne / 1.16 lb. Chassis and cover
Electrostatic Discharge		-2:2014, 4 TH ed./IEC 61000-6-2:200
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge
Radiated Electromagnetic Field Electrical Fast Transients/Bursts	EN 61000-4-3 EN 61000-4-4	80MHz-2.7GHz, 10V/m, 80% AM
		±2 KV, 5KHz/100KHz
Surge Immunity Conducted Immunity	EN 61000-4-5 EN 61000-4-6	±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.
Voltage Dips	EN 61000-4-8	0% U _T , 0.5 cycles, 0-315° 100/240V A
vollage Dips	_IV 0 1000-4-11	0% U _T , 1 cycles, 0° 100/240V A
		40% U _T , 10/12 cycles, 0° 100/240V E
		70% U _T , 25/30 cycles, 0° 100/240V E
Voltage Interruptions	EN 61000-4-11	0% U _T , 300 cycles, 0° 100/240V E
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

EN 61000-3-3

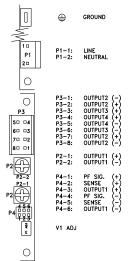
Compliant

Voltage Fluctuations/Flicker

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 90Vin to 90% load at 85Vin
- 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 80-50-0189 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.

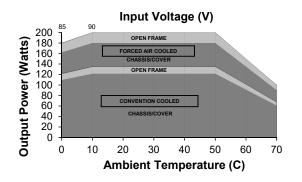
P2: 6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb Max)

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

- 1. 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 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 400mV, depending on model. The use of a twisted pair, decoupling capacitors and an appropriatelyrated low-impedance capacitor connected across the load will increase noise immunity.
- 10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
- 11. 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.
- 12. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
- 13. 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.
- 14. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
- 15. A 3% increase above nominal voltage of Output 1 is required to meet ±5% centering of Output 2 on 4002 only.

MAX Pout vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Rev. HH 2/23/2017

SINGLE/MULTI OUTPUT AC-DC

FEATURES:

- Compact 2.5 x 4.5" x 1.2" Size
- 2 Year Warranty
- Universal 85-264V Input
- One to Four Outputs
- High Efficiency
- 0-70°C Operating Temperature Optional Chassis/Cover
- IEC 60601-1 3rd ed. Medical Cert.
 - IEC 60950-1 2nd ITE Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN55011/32
- RoHS Compliant





CHASSIS/COVER

OPEN FRAME

	SAFETY SPEC	CIFICATIONS
	Underwriters Laboratories	UL 60950-1:2007, 2 nd Edition
C THE US	File E137708/E140259	AAMI/ANSI ES60601-1:2005/(R) 2012
		CB Reports/Certificates (including all
TEGE:		National and Group Deviations)
СВ		IEC 60950-1/A2:2013, 2nd Edition
SCHEME		IEC 60601-1:2005/A1:2012
c FL us	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
TÜV	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 LIS	11110	
MODEL NO.	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
REL-70-4001	+3.3V/6A	+5V/5A	+12V/2A(21)	-12V/2A(21)
REL-70-4002	+5V/6A	+3.3V/5A	+12V/2A(21)	-12V/2A(21)
REL-70-4003	+5V/6A	+3.3V/5A	+15V/2A(21)	-15V/2A(21)
REL-70-4004	+5V/6A	-5V/5A	+12V/2A(21)	-12V/2A(21)
REL-70-4005	+5V/6A	-5V/5A	+15V/2A(21)	-15V/2A(21)
REL-70-4006	+5V/6A	+24V/2A	+12V/2A(21)	-12V/2A(21)
REL-70-4007	+5V/6A	+24V/2A	+15V/2A(21)	-15V/2A(21)
REL-70-4009	6.7V/5A	5V/4A	+15V/2A(21)	-15V/2A(21)
REL-70-3001	+5V/6A	+12V/2A		-12V/2A ₍₂₁₎
REL-70-3002	+5V/6A	+15V/2A		-15V/2A(21)
REL-70-3003	+5.1V/6A	+7.5V/2A		-7.5V/2A ₍₂₁₎
REL-70-3004	+3.3V/6A	+7V/5A	+12V/2A(21)	
REL-70-2001	+3.3V/6A	+5V/5A		
REL-70-2002	+5V/6A	+12V/4A		
REL-70-2003	+5V/6A	+24V/2A		
REL-70-2004	+12V/3A	-12V/3A		
REL-70-2005	+15V/3A	-15V/2A		
REL-70-2006	+5.5V/6A	-5.5V/5A		
REL-70-1001	2.5V/14A ₍₂₀₎			
REL-70-1002	3.3V/14A ₍₂₀₎			
REL-70-1003	5V/14A ₍₂₀₎			
REL-70-1004	12V/5.8A			
REL-70-1005	15V/4.7A			
REL-70-1006	24V/2.9A			
REL-70-1007	28V/2.5A			
REL-70-1008	48V/1.5A			

ORDERING INFORMATION

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

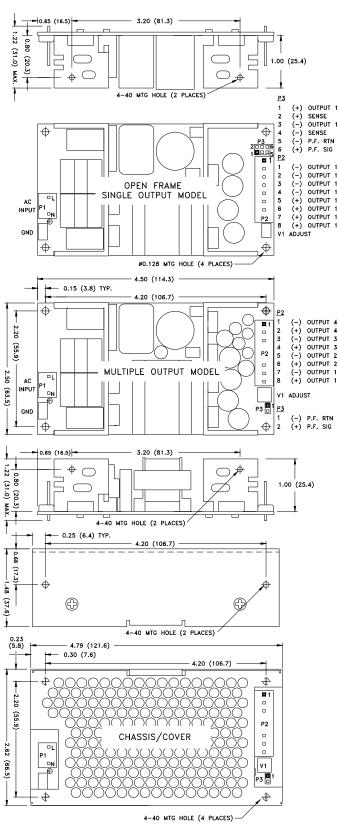
CH - Chassis I/O - Isolated Outputs CO - Cover TS - Terminal Strip

	PUT SPECIF	
Total Output Power at 50°C ₍₁₎ (See Derating Chart)	50W 70W	Convection Cooled ₍₁₆₎₍₁₈₎ 300LFM Forced-Air Cooled ₍₁₅₎₍₁₇₎₍₁₉₎
Output Voltage Centering	Output 1:	$\pm 0.5\%$ (All outputs at 50% load)
	Output 2,3,4:	± 5.0%
Output Voltage Adjust Range	Output 1:	95 - 105%
Load Regulation	Output 1: Output 2:	0.5% (10-100% load change) 5.0%
	(4001-5)	8.0%
	(2001)	8.0%
	Output 3:	5.0%
Course Degulation	Output 4: Outputs 1 – 4:	5.0% 0.5%
Source Regulation Cross Regulation	Outputs 1 – 4:	5.0%
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 Output Overvoltage Protection	50% to 100% Output 1:	110% to 150%
Output Overpower Protection		Pout, cycle on/off, auto recovery
Hold Up Time		Power, 85V Input
Start Up Time	4 Seconds, 120	V Input
	UT SPECIFI	CATIONS
Protection Class	1	
Source Voltage	85 – 264 Volts A	AC .
Frequency Range Peak Inrush Current	47 – 63 Hz 40A	
Efficiency		Power, 230V, varies by model
Power Factor	0.95 (Full Power	
		PECIFICATIONS
Ambient Operating	0°C to + 70°C	
Temperature Range	Derating: See P	ower Rating Chart
Ambient Storage Temp. Range	- 40°C to + 85°C	2
Temperature Coefficient	Outputs 1 – 4:	0.02%/°C
	RAL SPECI	FICATIONS
Means of Protection Primary to Secondary	2M∩PP (Means	of Patient Protection)
Primary to Ground	,	of Patient Protection)
Secondary to Ground		llation(Consult factory for 1MOOP or 1MOPF
Dielectric Strength _(8, 9)		-
Reinforced Insulation		nary to Secondary
Basic Insulation	2121 VDC, Prim	
Operational Insulation Leakage Current	707 VDC, Sect	ondary to Ground
Earth Leakage		
E ALLI LEANAUE	<300µA NC. <1	000µA SEC
Touch Current	<300μA NC, <1 <100μA NC, <5	
Touch Current	<100µA NC, <5 Logic low with ir	00µA SFC nput power failure 10 ms
Touch Current Power Fail Signal ₍₁₄₎	<100µA NC, <5 Logic low with ir minimum prior to	00µA SFC nput power failure 10 ms o Output 1 dropping 1%
Touch Current Power Fail Signal ₍₁₄₎ Remote Sense (singles only) ₍₁₀₎	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen	00µA SFC nput power failure 10 ms o Output 1 dropping 1% sation of output cable losses
Touch Current Power Fail Signal ₍₁₄₎ Remote Sense (singles only) ₍₁₀₎ Mean-Time Between Failures	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours in	00µA SFC nput power failure 10 ms o Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB
Touch Current Power Fail Signal ₍₁₄₎ Remote Sense (singles only) ₍₁₀₎ Mean-Time Between Failures	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours in 0.60 Lbs. Op	00µA SFC nput power failure 10 ms 0 Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB pen Frame
Touch Current Power Fail Signal ₍₁₄₎ Remote Sense (singles only) ₍₁₀₎ Mean-Time Between Failures Weight	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours of 0.60 Lbs. Op 1.00 Lbs. Ch	00µA SFC nput power failure 10 ms o Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB ten Frame lassis and Cover
Touch Current Power Fail Signal ₍₁₄₎ Remote Sense (singles only) ₍₁₀₎ Mean-Time Between Failures Weight EMC SPECIFICATION:	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours of 0.60 Lbs. Op 1.00 Lbs. Ch	00µA SFC nput power failure 10 ms o Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB ven Frame assis and Cover -2:2014, 4 TH ED./IEC 61000-6-2:2005
Touch Current Power Fail Signal(14) Remote Sense (singles only)(10) Mean-Time Between Failures Weight EMCSPECIFICATION: Electrostatic Discharge	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours I 0.60 Lbs. Op 1.00 Lbs. Ch S (IEC 60601-1	00µA SFC nput power failure 10 ms o Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB ven Frame assis and Cover -2:2014, 4 TH ED./IEC 61000-6-2:2005) ±8KV contact / ±15KV air discharge
Touch Current Power Fail Signal(14) Remote Sense (singles only)(10) Mean-Time Between Failures Weight EMCSPECIFICATION: Electrostatic Discharge Radiated Electromagnetic Field	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours I 0.60 Lbs. Op 1.00 Lbs. Ch S (IEC 60601-1: EN 61000-4-2	00µA SFC put power failure 10 ms o Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB ben Frame assis and Cover -2:2014, 4 TH ED./IEC 61000-6-2:2005 ±8KV contact / ±15KV air discharge 80MHz-2.7GHz, 10V/m, 80% AM
Touch Current Power Fail Signal(14) Remote Sense (singles only)(10) Mean-Time Between Failures Weight EMCSPECIFICATION: Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours 1 0.60 Lbs. Op 1.00 Lbs. Ch S (IEC 60601-1 EN 61000-4-2 EN 61000-4-3	00µA SFC put power failure 10 ms o Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB pen Frame passis and Cover -2:2014, 4 TH ED./IEC 61000-6-2:2005 ±8KV contact / ±15KV air discharge 80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line
Touch Current Power Fail Signal(14) Remote Sense (singles only)(10) Mean-Time Between Failures Weight EMCSPECIFICATION: Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours to 0.60 Lbs. Op 1.00 Lbs. Ch S (IEC 60601-1 EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6	00µA SFC put power failure 10 ms o Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB ener Frame bassis and Cover -2:2014, 4 TH ED./IEC 61000-6-2:2005 ±8KV contact / ±15KV air discharge 80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM
Touch Current Power Fail Signal(14) Remote Sense (singles only)(10) Mean-Time Between Failures Weight EMC SPECIFICATION: Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours of 0.60 Lbs. Op 1.00 Lbs. Op S (IEC 60601-1 EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	00µA SFC put power failure 10 ms 0 Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB pen Frame lassis and Cover -2:2014, 4 TH ED./IEC 61000-6-2:2005) ±8KV contact / ±15KV air discharge 80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz.
Touch Current Power Fail Signal(14) Remote Sense (singles only)(10) Mean-Time Between Failures Weight EMC SPECIFICATION: Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours to 0.60 Lbs. Op 1.00 Lbs. Ch S (IEC 60601-1 EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6	00µA SFC put power failure 10 ms 0 Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB pen Frame assis and Cover -2:2014, 4 TH ED./IEC 61000-6-2:2005) ±8KV contact / ±15KV air discharge 80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. 0% U _T , 0.5 cycles, 0-315° 100/240V A/
Touch Current Power Fail Signal(14) Remote Sense (singles only)(10) Mean-Time Between Failures Weight EMC SPECIFICATION: Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours of 0.60 Lbs. Op 1.00 Lbs. Op S (IEC 60601-1 EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	00µA SFC put power failure 10 ms 0 Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB pen Frame assis and Cover -2:2014, 4 TH ED./IEC 61000-6-2:2005 ±8KV contact / ±15KV air discharge 80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. 0% U _T , 0.5 cycles, 0·315° 100/240V A/ 0% U _T , 1 cycles, 0° 100/240V A/
Touch Current Power Fail Signal(14) Remote Sense (singles only)(10) Mean-Time Between Failures Weight EMC SPECIFICATION: Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours of 0.60 Lbs. Op 1.00 Lbs. Op S (IEC 60601-1: EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	00µA SFC put power failure 10 ms o Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB pen Frame assis and Cover 2:2014, 4 TH ED./IEC 61000-6-2:2005 ±8KV contact /±15KV air discharge 80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth /±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. 0% U _T , 0.5 cycles, 0-315° 100/240V A/ 0% U _T , 1 cycles, 0° 100/240V A/ 40% U _T , 10/12 cycles, 0° 100/240V B/
Touch Current Power Fail Signal(14) Remote Sense (singles only)(10) Mean-Time Between Failures Weight EMC SPECIFICATION: Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours 0.60 Lbs. Op 1.00 Lbs. Ch S (IEC 60601-1 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-8 EN 61000-4-11	00μA SFC put power failure 10 ms 0 Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB pen Frame assis and Cover -2:2014, 4 TH ED./IEC 61000-6-2:2005) ±8KV contact / ±15KV air discharge 80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. 0% U _T , 0.5 cycles, 0-315° 100/240V A/ 0% U _T , 1 cycles, 0° 100/240V A/ 40% U _T , 10/12 cycles, 0° 100/240V B/ 70% U _T , 25/30 cycles, 0° 100/240V B/
Touch Current Power Fail Signal(14) Remote Sense (singles only)(10) Mean-Time Between Failures Weight EMC SPECIFICATION: Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours of 0.60 Lbs. Op 1.00 Lbs. Op S (IEC 60601-1: EN 61000-4-2 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	00µA SFC put power failure 10 ms 0 Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB pen Frame assis and Cover 2:2014, 4 TH ED./IEC 61009-6-2:2005) ±8KV contact / ±15KV air discharge 80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. 0% U _T , 0.5 cycles, 0-315° 100/240V A/ 0% U _T , 1 cycles, 0° 100/240V A/ 40% U _T , 10/12 cycles, 0° 100/240V B/ 70% U _T , 25/30 cycles, 0° 100/240V B/ 70% U _T , 25/30 cycles, 0° 100/240V B/
Touch Current Power Fail Signal(14) Remote Sense (singles only)(10) Mean-Time Between Failures Weight EMCSPECIFICATION: Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips Voltage Interruptions Radiated Emissions Conducted Emissions	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours ir 0.60 Lbs. Op 1.00 Lbs. Ch S (IEC 60601-1 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-5 EN 61000-4-11 EN 61000-4-11 EN 55011/32 EN 55011/32	00μA SFC put power failure 10 ms 0 Output 1 dropping 1% sation of output cable losses min., MIL-HDBK-217F, 25° C, GB een Frame assis and Cover -2:2014, 4 TH ED./IEC 61000-6-2:2005) ±8KV contact / ±15KV air discharge 80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. 0% U _T , 0.5 cycles, 0-315° 100/240V A// 40% U _T , 10/12 cycles, 0° 100/240V B// 70% U _T , 25/30 cycles, 0° 100/240V B// Class B Class B
Touch Current Power Fail Signal(14) Remote Sense (singles only)(10) Mean-Time Between Failures Weight	<100µA NC, <5 Logic low with ir minimum prior to 250mV compen 100,000 Hours is 0.60 Lbs. Op 1.00 Lbs. Ch S (IEC 60601-1. EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-11 EN 61000-4-11 EN 61000-4-11 EN 65011/32	00μA SFC put power failure 10 ms

All specifications are maximum at 25°C/70W unless otherwise stated, may vary by model and are subject to change without notice.



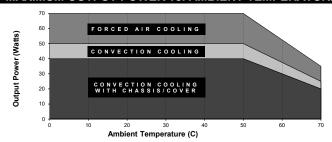
REL-70 MECHANICAL SPECIFICATIONS



ALL DIMENSIONS IN INCHES (mm)

APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 70W, 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 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 (single output models only). 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 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 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.
- 16. Total power must not exceed 50W with convection cooling on open-frame models.
- 17. Total power must not exceed 70W with 300LFM forced-air cooling on open-frame models.
- 18. Total power must not exceed 40W with convection cooling and Chassis/Cover option.
- Total power must not exceed 70W with 300LFM forced-air cooling and Chassis/Cover option.
- 20. Rated 10A with convection cooling.
- 21. Rated 1.5A with convection cooling



		CONNECTOR SPECIFICATIONS
P1	AC Input	0.156 friction lock header mates with Tyco 640250-3 or
		equivalent crimp terminal housing with Tyco 3-640706-1 or
		equivalent crimp terminal.
P2	DC Output	0.156 friction lock header mates with Tyco 770849-8 or
	(Single)	equivalent crimp terminal housing with Tyco 3-640707-1 or
		equivalent crimp terminal.
P2	DC Output	0.156 friction lock header mates with Tyco 770849-8 or
	(Multiple)	equivalent crimp terminal housing with Tyco 3-640707-1 or
		equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	P.F./Sense	0.100 breakaway header mates with Molex 22-55-2061 or
	(Single)	equivalent crimp terminal housing with Molex type 71851 or
		equivalent crimp terminal.
P3	Power Fail	0.100 breakaway header mates with Molex 50-57-9002 or
	(Multiple)	equivalent crimp terminal housing with Molex type 71851 or
		equivalent crimp terminal.

- Compact 3" x 5" x 1.3" 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 Chassis/Cover



CHASSIS/COVER

OPEN FRAME

	SAFETY SPEC	CIFICATIONS
. 71	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME	FIIE E137700/E140239	CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c 911 us	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 SUD National Parts	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)
	MODELI	ISTING

N.		П		ie:	ΠN	16
М	OD	ודנ	-	IST	ПΝ	(C

REL-110-4001 +3.3V/10A ₍₂₂₎ +5V/6A +12V/2A -12V/2A REL-110-4002 +5V/10A ₍₂₂₎ +3.3V/6A +12V/2A -12V/2A REL-110-4003 +5V/10A ₍₂₂₎ +3.3V/6A +15V/2A -15V/2A REL-110-4004 +5V/10A ₍₂₂₎ -5V/6A +12V/2A -12V/2A REL-110-4005 +5V/10A ₍₂₂₎ -5V/6A +12V/2A -12V/2A REL-110-4006 +5V/10A ₍₂₂₎ +24V/2A +12V/2A -12V/2A REL-110-4006 +5V/10A ₍₂₂₎ +24V/2A +15V/2A -15V/2A REL-110-4009 +5V/10A ₍₂₂₎ +24V/2A +15V/2A -15V/2A REL-110-3001 +5V/10A ₍₂₂₎ +24V/2A +7V/2.5A -7V/2.5A REL-110-3001 +5V/10A ₍₂₂₎ +12V/3A -12V/3A REL-110-3002 +5V/10A ₍₂₂₎ +15V/2A -15V/2A REL-110-3003 +8V/6A -8V/1A +30V/1A REL-110-3004 +9V/3A -24V/3A +13V/2A REL-110-2001 +3.3V/10A ₍₂₂₎ +5V/6A REL-110-2002 +5V/10A ₍₂₂₎ +2V/3A +13V/2A REL-110-2003 +5V/10A ₍₂₂₎ +5V/6A REL-110-2004 +12V/5A -12V/5A REL-110-2005 +5V/10A ₍₂₂₎ +2V/3A REL-110-2005 +15V/4A -15V/3A REL-110-2006 +18V/4A -15V/3A REL-110-2006 +18V/4A -18V/3A REL-110-2001 2.5V/22A ₍₂₃₎
REL-110-4002 +5V/10A(22) +3.3V/6A +12V/2A -12V/2A REL-110-4003 +5V/10A(22) +3.3V/6A +15V/2A -15V/2A REL-110-4004 +5V/10A(22) -5V/6A +12V/2A -12V/2A REL-110-4005 +5V/10A(22) -5V/6A +15V/2A -15V/2A REL-110-4006 +5V/10A(22) +24V/2A +12V/2A -12V/2A REL-110-4007 +5V/10A(22) +24V/2A +15V/2A -15V/2A REL-110-4009 +5V/10A(22) +24V/2A +15V/2A -7V/2.5A REL-110-3001 +5V/10A(22) +24V/2A +7V/2.5A -7V/2.5A REL-110-3002 +5V/10A(22) +12V/3A -12V/3A REL-110-3003 +8V/6A -8V/1A +30V/1A REL-110-3004 +9V/3A -24V/3A +13V/2A REL-110-2001 +3.3V/10A(22) +5V/6A REL-110-2001 +3.3V/10A(22) +5V/6A REL-110-2001 +3.5V/10A(22) +12V/5A REL-110-2004 +12V/5A -12V/4A REL-110-2005 +15V/1A -15V/3A REL-110-2006 +18V/4A -18V/3A
REL-110-4004 +5V/10A(22) -5V/6A +12V/2A -12V/2A
REL-110-4005 +5V/10A(22) -5V/6A +15V/2A -15V/2A REL-110-4006 +5V/10A(22) +24V/2A +12V/2A -12V/2A REL-110-4007 +5V/10A(22) +24V/2A +15V/2A -15V/2A -15V/2A REL-110-4009 +5V/10A(22) +24V/2A +7V/2.5A -7V/2.5A REL-110-3001 +5V/10A(22) +12V/3A -12V/3A REL-110-3002 +5V/10A(22) +12V/3A -15V/2A -15V/2A REL-110-3003 +8V/6A -8V/1A +30V/1A REL-110-3004 +9V/3A -24V/3A +13V/2A REL-110-2001 +3.3V/10A(22) +5V/6A REL-110-2001 +5V/10A(22) +12V/5A REL-110-2002 +5V/10A(22) +12V/5A REL-110-2003 +5V/10A(22) +24V/3A REL-110-2004 +12V/5A -12V/4A REL-110-2006 +15V/4A -15V/3A REL-110-2006 +18V/4A -18V/3A
REL-110-4006 +5V/10A(22) +24V/2A +12V/2A -12V/2A
REL-110-4007 +5V/10A(22) +24V/2A +15V/2A -15V/2A -7V/2.5A REL-110-4009 +5V/10A(22) +24V/2A +7V/2.5A -7V/2.5A REL-110-3001 +5V/10A(22) +12V/3A -12V/3A REL-110-3002 +5V/10A(22) +15V/2A -15V/2A -15V/2A REL-110-3003 +8V/6A -8V/1A +30V/1A REL-110-3004 +9V/3A -24V/3A +13V/2A REL-110-2001 +3.3V/10A(22) +5V/6A REL-110-2002 +5V/10A(22) +12V/5A REL-110-2003 +5V/10A(22) +24V/3A REL-110-2004 +12V/5A -12V/4A REL-110-2005 +15V/4A -15V/3A REL-110-2006 +18V/4A -18V/3A
REL-110-4009 +5V/10A(22) +24V/2A +7V/2.5A -7V/2.5A REL-110-3001 +5V/10A(22) +12V/3A -12V/3A REL-110-3002 +5V/10A(22) +15V/2A -15V/2A REL-110-3003 +8V/6A -8V/1A +30V/1A REL-110-2001 +3.3V/10A(22) +5V/6A REL-110-2002 +5V/10A(22) +12V/5A REL-110-2003 +5V/10A(22) +24V/3A REL-110-2004 +12V/5A -12V/4A REL-110-2005 +15V/4A -15V/3A REL-110-2006 +18V/4A -18V/3A
REL-110-3001 +5V/10A(22) +12V/3A -12V/3A -15V/2A -15V/3A -110-2001 +3.3V/10A(22) +5V/6A -12V/5A -12V/5
REL-110-3002 +5V/10A(22) +15V/2A -15V/2A +30V/1A REL-110-3003 +8V/6A -8V/1A +30V/1A +30V/1A REL-110-3004 +9V/3A -24V/3A +13V/2A REL-110-2001 +3.3V/10A(22) +5V/6A REL-110-2002 +5V/10A(22) +12V/5A REL-110-2003 +5V/10A(22) +24V/3A REL-110-2004 +12V/5A -12V/4A REL-110-2005 +15V/4A -15V/3A REL-110-2006 +18V/4A -18V/3A
REL-110-3003 +8V/6A -8V/1A +30V/1A REL-110-3004 +9V/3A -24V/3A +13V/2A REL-110-2001 +3.3V/10A ₍₂₂₎ +5V/6A REL-110-2002 +5V/10A ₍₂₂₎ +12V/5A REL-110-2003 +5V/10A ₍₂₂₎ +24V/3A REL-110-2004 +12V/5A -12V/4A REL-110-2005 +15V/4A -15V/3A REL-110-2006 +18V/4A -18V/3A
REL-110-3004 +9V/3A -24V/3A +13V/2A REL-110-2001 +3.3V/10A ₍₂₂₎ +5V/6A REL-110-2002 +5V/10A ₍₂₂₎ +12V/5A REL-110-2003 +5V/10A ₍₂₂₎ +24V/3A REL-110-2004 +12V/5A -12V/4A REL-110-2005 +15V/4A -15V/3A REL-110-2006 +18V/4A -18V/3A
REL-110-2001 +3.3V/10A ₍₂₂₎ +5V/6A REL-110-2002 +5V/10A ₍₂₂₎ +12V/5A REL-110-2003 +5V/10A ₍₂₂₎ +24V/3A REL-110-2004 +12V/5A -12V/4A REL-110-2005 +15V/4A -15V/3A REL-110-2006 +18V/4A -18V/3A
REL-110-2002 +5V/10A(22) +12V/5A REL-110-2003 +5V/10A(22) +24V/3A REL-110-2004 +12V/5A -12V/4A REL-110-2005 +15V/4A -15V/3A REL-110-2006 +18V/4A -18V/3A
REL-110-2003 +5V/10Å(22) +24V/3A REL-110-2004 +12V/5A -12V/4A REL-110-2005 +15V/4A -15V/3A REL-110-2006 +18V/4A -18V/3A
REL-110-2004 +12V/5A -12V/4A REL-110-2005 +15V/4A -15V/3A REL-110-2006 +18V/4A -18V/3A
REL-110-2005 +15V/4A -15V/3A REL-110-2006 +18V/4A -18V/3A
REL-110-2006 +18V/4A -18V/3A
REL-110-1001 2.5V/22A ₍₂₃₎
REL-110-1002 3.3V/22A ₍₂₃₎
REL-110-1003 5V/22A ₍₂₃₎
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
ORDERING INFORMATION

Consult factory for alternate output configurations.

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

I/O - Isolated Outputs CH - Chassis CO - Cover TS - Terminal Strip

	KEL-	110
OUT	PUT SPECII	FICATIONS
Total Output Power at 50°C ₍₁₎	80W	Convection Cooled ₍₁₆₎₍₁₈₎
(See Derating Chart)	110W	300LFM Forced-Air Cooled(15)(17)(19)
Output Voltage Centering	Output 1:	± 0.5% (All outputs
	Output 2:	± 5.0% at 50% load)
	Output 3:	± 5.0%
	Output 4:	± 5.0%
Output Voltage Adjust Range	Output 1:	95-105%
Load Regulation	Output 1:	0.5% (10-100% load change) 5.0%
	Output 2: (4001-5 Models	
	(2001 Model)	6.0%
	Output 3:	5.0%
	Output 4:	5.0%
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	
Voltage Deviation Recovery Time	5.0%	
Load Change	500μS 50% to 100%	
Output Overvoltage Protection	Output 1:	110% to 150%
Output Overpower Protection		Pout, cycle on/off, auto recovery
Hold Up Time		Power, 85V Input
Start Up Time	4 Seconds, 120	V Input
INF	PUT SPECIF	
Protection Class	Į	
Source Voltage	85 – 264 Volts A	AC .
Frequency Range	47 – 63 Hz	
Peak Inrush Current	40A	
Efficiency		Power, 230V, varies by model
Power Factor	0.95 (Full Powe	
		PECIFICATIONS
Ambient Operating Temperature Range	0°C to + 70°C	Power Rating Chart
Ambient Storage Temp. Range	- 40°C to + 85°C	
Temperature Coefficient	Outputs 1 – 4:	0.02%/°C
		IFICATIONS
Means of Protection		
Primary to Secondary	2MOPP (Means	s of Patient Protection)
Primary to Ground		s of Patient Protection)
Secondary to Ground	Operational Insu	ulation(Consult factory for 1MOOP or 1MOP
Dielectric Strength(8, 9)	5/5/1/D0 D1	
Reinforced Insulation		nary to Secondary
Basic Insulation Operational Insulation	2121 VDC, Prim	nary to Ground ondary to Ground
Leakage Current	707 VDC, 380	oridary to Oround
Earth Leakage	<300µA NC, <1	000µA SFC
Touch Current	<100µA NC, <5	
Power Fail Signal ₍₁₄₎		nput power failure 10 ms
	minimum prior t	o Output 1 dropping 1%
Remote Sense (singles only)(10)	250mV compen	sation of output cable losses
Mean-Time Between Failures		min., MIL-HDBK-217F, 25° C, GB
Weight	0.80 Lbs. Oper	Frame/ 1.28 Lbs. Chassis and Cover
		-2:2014, 4 TH ed./IEC 61000-6-2:2005
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to line
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.
Voltage Dips	EN 61000-4-11	0% U _T , 0.5 cycles, 0-315° 100/240V A
		0% U _T , 1 cycles, 0° 100/240V A 40% U _T , 10/12 cycles, 0° 100/240V B
		70% U _T , 25/30 cycles, 0° 100/240V B
Voltage Interruptions	EN 61000-4-11	0% U _T , 300 cycles, 0° 100/240V 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, 110W unless otherwise stated, may vary by model and are subject to change without notice.

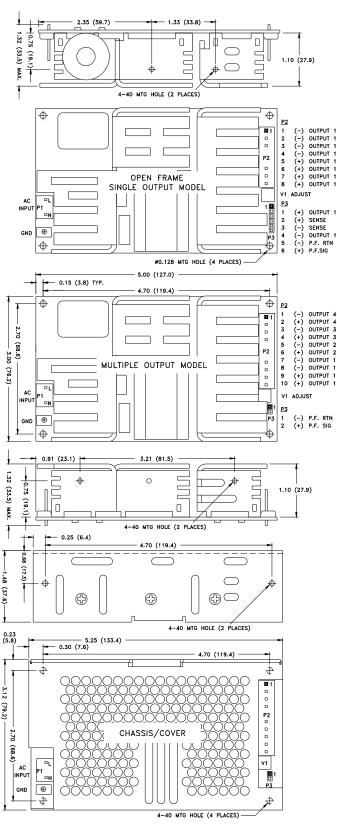
Compliant

EN 61000-3-3



Voltage Fluctuations/Flicker

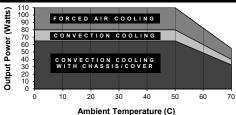
REL-110 SERIES MECHANICAL SPECIFICATIONS



ALL DIMENSIONS IN INCHES (mm)

APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 110W, 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.
- 8. 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 (single-output models only). 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 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 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 80W with convection cooling on open-frame models except where noted.
- Total power must not exceed 110W with 300LFM forced-air cooling on open-frame models.
- 18. Total power must not exceed 65W with convection cooling and Chassis/Cover option.
- Total power must not exceed 110W with 300LFM forced-air cooling and Chassis/Cover option
- 20. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
- 21. Total current from Outputs 1 & 2 must not exceed 12A with convection cooling.
- 22. Rated 8A maximum with convection cooling.23. Rated 16A maximum with convection cooling



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		CONNECTOR SPECIFICATIONS
P1	AC Input	0.156 friction lock header mates with Tyco 640250-3 or
		equivalent crimp terminal housing with Tyco 3-640706-1 or
		equivalent crimp terminal.
P2	DC Output	0.156 friction lock header mates with Tyco 770849-8 or
	(Single)	equivalent crimp terminal housing with Tyco 3-640707-1 or
		equivalent crimp terminal.
P2	DC Output	0.156 friction lock header mates with Tyco 1-770849-0 or
	(Multiple)	equivalent crimp terminal housing with Tyco 3-640707-1 or
		equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	P.F./Sense	0.100 breakaway header mates with Molex 50-57-9006 or
	(Single)	equivalent crimp terminal housing with Molex type 71851 or
		equivalent crimp terminal.
P3	P.F.	0.100 breakaway header mates with Molex 50-57-9002 or
	(Multiple)	equivalent crimp terminal housing with Molex type 71851 or
		equivalent crimp terminal.

- Compact 3.8" x 6.0" x 1.3" 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					
c FM us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012			
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2 nd Edition IEC 60601-1:2005/A1:2012			
c 911 us	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 SUD No. 15 TO TO	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013			
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)			
	MODEL LISTING				

MO	DEI	LIST	NG

MODEL	OUTPUT 1 ₍₁	₉₎ OUTPUT 2	(19) OUTPUT 3	3 ₍₁₈₎ OUTPUT 4 ₍₁₈₎
REL-150-4001	+3.3V/15A ₍₂₀₎	+5V/8A	+12V/2A	-12V/2A
REL-150-4002	+5V/15A(20)	+3.3V/8A	+12V/2A	-12V/2A
REL-150-4003	+5V/15A ₍₂₀₎	+3.3V/8A	+15V/2A	-15V/2A
REL-150-4004	+5V/15A(20)	-5V/8A	+12V/2A	-12V/2A
REL-150-4005	+5V/15A ₍₂₀₎	-5V/8A	+15V/2A	-15V/2A
REL-150-4006	+5V/15A(20)	+24V/3A	+12V/2A	-12V/2A
REL-150-4007	+5V/15A ₍₂₀₎	+24V/3A	+15V/2A	-15V/2A
REL-150-4009	+24V/2.3A	+10V/1A	+6V/1.6A	-6V/.31A
REL-150-4010	5V/15A ₍₂₀₎	12V/5A	24V/1A	24V/1A
REL-150-3001	+5V/15A ₍₂₀₎	+12V/4A		-12V/3A
REL-150-3002	+5V/15A(20)	+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 ₍₂₀₎	+15.5V/3A		-15.5V/2A
REL-150-2001	+3.3V/15A ₍₂₀₎	+5V/8A		
REL-150-2002	+5V/15A ₍₂₀₎	+12V/5A		
REL-150-2003	+5V/15A(20)	+24V/3A		
REL-150-2004	+12V/7.5A	-12V/5A		
REL-150-2005	+15V/5A	-15V/5A		
REL-150-1001	2.5V/30A ₍₂₁₎			<u> </u>
REL-150-1002	3.3V/30A ₍₂₁₎			
REL-150-1003	5V/30A ₍₂₁₎			
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			

ORDERING INFORMATION

Consult factory for alternate output configurations. Consult factory for positive, negative or floating outputs. REL-150-4010: TUV only.

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

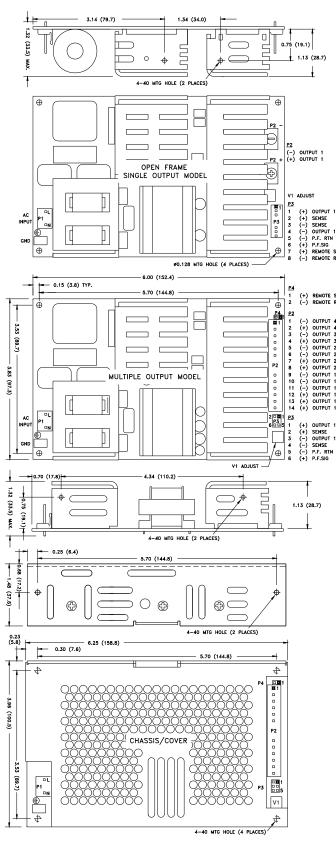
Total Output Power at 50°C ₍₁₎ (See Derating Chart)	100W 150W	Convection Cooled ₍₁₆₎₍₁₇₎ Forced-Air Cooled ₍₁₅₎₍₁₆₎₍₁₇₎
Output Voltage Centering	Output 1:	± 0.5% (All outputs at 50% load)
Output voltage Centering	Output 1:	± 5.0% (All outputs at 50% load)
	Output 3:	± 5.0%
	Output 4:	
Output Voltage Adjust Bange		± 5.0% 95-105%
Output Voltage Adjust Range Load Regulation	Output 1: Output 1:	0.5% (10-100% load change)
Load Regulation	Output 1:	5.0% (10-100% load change)
	(4001-5 Models)	8.0% (20-100% load change)
	(2001 Model)	6.0% (20-100% load change)
	Output 3:	5.0% (10-100% load change)
	Output 4:	5.0% (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	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 I	
Start Up Time	5 Seconds, 120V	
	UT SPECIFIC	
Protection Class		
Source Voltage	85 – 264 Volts A	C
Frequency Range	47 – 63 Hz	-
Peak Inrush Current	40A	
Efficiency	82% Tvp., Full P	ower, 230V, varies by model
Power Factor	0.95 (Full Power	230V)
		ECIFICATIONS
Ambient Operating	0°C to + 70°C	
Temperature Range		wer Rating Chart
Ambient Storage Temp, Range	- 40°C to + 85°C	
Ambient Storage Temp. Range Temperature Coefficient	- 40°C to + 85°C	
Temperature Coefficient	Outputs 1 – 4:	0.02%/°C
Temperature Coefficient GENE		0.02%/°C
Temperature Coefficient GENE Means of Protection	Outputs 1 – 4: ERAL SPECII	0.02%/°C FICATIONS
Temperature Coefficient GENE Means of Protection Primary to Secondary	Outputs 1 – 4: ERAL SPECIE 2MOPP (Means	0.02%/°C
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground	Outputs 1 – 4: ERAL SPECII 2MOPP (Means 1MOPP (Means	0.02%/°C FICATIONS of Patient Protection) of Patient Protection)
Temperature Coefficient GENE Means of Protection Primary to Secondary	Outputs 1 – 4: ERAL SPECII 2MOPP (Means 1MOPP (Means	0.02%/°C FICATIONS of Patient Protection) of Patient Protection)
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground	Outputs 1 – 4: ERAL SPECII 2MOPP (Means 1MOPP (Means	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP)
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength(8, 9)	Outputs 1 – 4: ERAL SPECII 2MOPP (Means 1MOPP (Means Operational Insul	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8, 9) Reinforced Insulation	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 5656 VDC, Prima 2121 VDC, Prima	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8, 9) Reinforced Insulation Basic Insulation	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 5656 VDC, Prima 2121 VDC, Prima	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 5656 VDC, Prima 2121 VDC, Prima	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground indary to Ground
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current	Outputs 1 – 4: ERAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 5656 VDC, Prima 2121 VDC, Prima 707 VDC, Seco	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground ndary to Ground
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage	Outputs 1 – 4: FRAL SPECII 2MOPP (Means 1MOPP (Means Operational Insul 5656 VDC, Prima 2121 VDC, Prima 707 VDC, Seco <300µA NC, <10 <100µA NC, <50 Logic low with in	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground ndary to Ground 100µA SFC 10µA SFC 10µA SFC 10µA power failure 10 ms
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8,9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal ₍₁₄₎	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground ndary to Ground 100µA SFC 0µA SFC but power failure 10 ms Output 1 dropping 1%
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal ₍₁₄₎ Remote Inhibit (optional)	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 5656 VDC, Prima 2121 VDC, Prima 707 VDC, Seco <300µA NC, <10 <100µA NC, <50 Logic low with inj minimum prior to Contact closure i	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground ndary to Ground 100µA SFC 10µA SFC
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal ₍₁₄₎ Remote Inhibit (optional) Remote Sense ₍₁₀₎	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground ndary to Ground 100μΑ SFC 10μΑ SFC 10μα SFC 10μα SFC 10μα SFC 10μη A
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal(14) Remote Inhibit (optional) Remote Sense(10) Mean-Time Between Failures	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 1	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground andary to Ground 000µA SFC 00µA SF
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal ₍₁₄₎ Remote Inhibit (optional) Remote Sense ₍₁₀₎ Mean-Time Between Failures Weight	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 15656 VDC, Prima 2121 VDC, Prima 707 VDC, Seco <300µA NC, <10	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground andary to Ground 00µA SFC 0µA SFC 0µA SFC out power failure 10 ms Output 1 dropping 1% nhibits all outputs ation of output cable losses in., MIL-HDBK-217F, 25° C, GB Frame/ 1.82 Lbs. Chassis and Cover
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal ₍₁₄₎ Remote Inhibit (optional) Remote Sense ₍₁₀₎ Mean-Time Between Failures Weight	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 15656 VDC, Prima 2121 VDC, Prima 707 VDC, Seco <300µA NC, <10	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground andary to Ground 000µA SFC 00µA SF
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Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal ₍₁₄₎ Remote Inhibit (optional) Remote Sense ₍₁₀₎ Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 15656 VDC, Prima 707 VDC, Seco <300µA NC, <100µA NC, <500 Logic low with in minimum prior to Contact closure in 250mV compens 100,000 Hours main 1.15 Lbs. Open S (IEC 60601-1-1-1500)	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground ndary to Ground 00µA SFC 0µA SFC 0µA SFC out power failure 10 ms Output 1 dropping 1% nhibits all outputs ation of output cable losses sin., MIL-HDBK-217F, 25° C, GB Frame/ 1.82 Lbs. Chassis and Cover 2:2014, 4 TH ed./IEC 61000-6-2:2005) ±8KV contact / ±15KV air discharge A
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal ₍₁₄₎ Remote Inhibit (optional) Remote Sense ₍₁₀₎ Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge	Outputs 1 – 4: FRAL SPECII 2MOPP (Means 1MOPP (Means Operational Insul 15656 VDC, Prima 707 VDC, Seco <300μA NC, <10 <100μA NC, <50 Logic low with in minimum prior to Contact closure i 250mV compens 100,000 Hours m 1.15 Lbs. Open S (IEC 60601-1-1-EN 61000-4-2	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground ndary to Ground 00µA SFC 0µA SFC 0µA SFC 0µt power failure 10 ms 0utput 1 dropping 1% nhibits all outputs ation of output cable losses iin., MIL-HDBK-217F, 25° C, GB Frame/ 1.82 Lbs. Chassis and Cover 2:2014, 4 TH ed./IEC 61000-6-2:2005) ±8KV contact / ±15KV air discharge A 80MHz-2.7GHz, 10V/m, 80% AM
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Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8,9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal ₍₁₄₎ Remote Inhibit (optional) Remote Sense ₍₁₀₎ Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 1st) 5656 VDC, Prima 2121 VDC, Prima 707 VDC, Seco <300µA NC, <10 <100µA NC, <50 <100µA NC, <50 Logic low with in minimum prior to Contact closure in 250mV compens 100,000 Hours mail 1st Lbs. Open 1st	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground 100μA SFC 10μA
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal(14) Remote Inhibit (optional) Remote Sense(10) Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Rediated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 1st) 5656 VDC, Prima 2121 VDC, Prima 707 VDC, Seco <300 µA NC, <10 <100 µA NC, <50 Logic low with in minimum prior to Contact closure i 250mV compens 100,000 Hours m 1.15 Lbs. Open S (IEC 60601-1-EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground ndary to Ground 100μA SFC 10μA SFC 10μA SFC 20μA SFC 20μA SFC 20μα
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Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal(14) Remote Inhibit (optional) Remote Sense(10) Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Rediated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 1st) 5656 VDC, Prima 2121 VDC, Prima 707 VDC, Seco <300 µA NC, <10 <100 µA NC, <50 Logic low with in minimum prior to Contact closure i 250mV compens 100,000 Hours m 1.15 Lbs. Open S (IEC 60601-1-EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground ndary to Ground noupat SFC out power failure 10 ms Output 1 dropping 1% nhibits all outputs ation of output cable losses hin., MIL-HDBK-217F, 25° C, GB Frame/ 1.82 Lbs. Chassis and Cover 2:2014, 4 TH ed./IEC 61000-6-2:2005) ±8KV contact / ±15KV air discharge ABOMHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz 42 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. O% UT, 0.5 cycles, 0-315° 100/240V A/A 40% UT, 10/12 cycles, 0° 100/240V B/A 40% UT, 10/12 cycles, 0° 100/240V B/A
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal(14) Remote Inhibit (optional) Remote Sense(10) Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips	Outputs 1 – 4: FRAL SPECII 2MOPP (Means 1MOPP (Means Operational Insul 15656 VDC, Prima 707 VDC, Seco <300μA NC, <10 <100μA NC, <50 <10μA NC, <	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground ndary to Ground noupat SFC out power failure 10 ms Output 1 dropping 1% nhibits all outputs ation of output cable losses ini., MIL-HDBK-217F, 25° C, GB Frame/ 1.82 Lbs. Chassis and Cover 2:2014, 4 TH ed./IEC 61000-6-2:2005) ±8KV contact /±15KV air discharge A 80MHz-2.7GHz, 10V/m, 80% AM A ±2 KV, 5KHz/100KHz A ±2 KV, line to earth /±1 KV line to line A 0.15 to 80MHz, 10V, 80% AM A 30A/m, 60 Hz. A 0% UT, 0.5 cycles, 0-315° 100/240V A/A 40% UT, 10/12 cycles, 0° 100/240V A/A 70% UT, 25/30 cycles, 0° 100/240V B/A
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength(8, 9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal(14) Remote Inhibit (optional) Remote Sense(10) Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Rediated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 15656 VDC, Prima 707 VDC, Seco 4300µA NC, <10 <100µA NC, <50 Logic low with in minimum prior to Contact closure i 250mV compens 100,000 Hours m 1.15 Lbs. Open S (IEC 60601-1-EN 61000-4-3 EN 61000-4-5 EN 61000-4-6 EN 61000-4-11 EN 61000-4-11	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground oπoμA SFC oμA SFC oμA SFC oμt power failure 10 ms Output 1 dropping 1% nhibits all outputs ation of output cable losses sin., MIL-HDBK-217F, 25° C, GB Frame/ 1.82 Lbs. Chassis and Cover 2:2014, 4 TH ed./IEC 61000-6-2:2005) ±8KV contact / ±15KV air discharge A 80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz Δ1.5 to 80MHz, 10V, 80% AM A 20, 15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. O% UT, 0.5 cycles, 0-315° 100/240V A/A 0% UT, 1 cycles, 0° 100/240V A/A 40% UT, 10/12 cycles, 0° 100/240V B/A 70% UT, 25/30 cycles, 0° 100/240V B/A 70% UT, 25/30 cycles, 0° 100/240V B/A
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8,9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal ₍₁₄₎ Remote Inhibit (optional) Remote Sense ₍₁₀₎ Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips Voltage Interruptions Radiated Emissions	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means 1MOPP (Means 0perational Insul 1MOPE) 5656 VDC, Prima 2121 VDC, Prima 707 VDC, Secons 100,004 NC, <500 (Means 1MOPE) Contact closure in 250mV compens 100,000 Hours mainimum prior to 100,000 Hours mainimum 1.15 Lbs. Open 1MOPE (IEC 60601-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground 100μA SFC 0μA SFC 0μA SFC 0μt power failure 10 ms 00tput 1 dropping 1% nhibits all outputs ation of output cable losses sin., MIL-HDBK-217F, 25° C, GB Frame/ 1.82 Lbs. Chassis and Cover 2:2014, 4 Th ed./IEC 61000-6-2:2005) ±8KV contact / ±15KV air discharge A 80MHz-2.7GHz, 10V/m, 80% AM Δ ±2 KV, 5KHz/100KHz A ±2 KV line to earth / ±1 KV line to line A 0.15 to 80MHz, 10V, 80% AM A 30A/m, 60 Hz. A 0% UT, 0.5 cycles, 0° 100/240V A/A 0% UT, 10/12 cycles, 0° 100/240V B/A 70% UT, 25/30 cycles, 0° 100/240V B/B Class B
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8,9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal ₍₁₄₎ Remote Inhibit (optional) Remote Sense ₍₁₀₎ Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips Voltage Interruptions Radiated Emissions Conducted Emissions	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means Operational Insul 1st) 5656 VDC, Prima 2121 VDC, Prima 707 VDC, Seco <300 µA NC, <10 <100 µA NC, <50 Logic low with in minimum prior to Contact closure i 250mV compens 100,000 Hours m 1.15 Lbs. Open S (IEC 60601-1-EN 61000-4-3 EN 61000-4-3 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8 EN 61000-4-11 EN 55011/32 EN 55011/32 EN 55011/32	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground 100μA SFC 0μA SFC 0μA SFC 0μt power failure 10 ms 00tput 1 dropping 1% nhibits all outputs ation of output cable losses inn, MIL-HDBK-217F, 25° C, GB Frame/ 1.82 Lbs. Chassis and Cover 2:2014, 4 TH ed./IEC 61000-6-2:2005) ±8KV contact / ±15KV air discharge A 80MHz-2.7GHz, 10V/m, 80% AM A ±2 KV, 5KHz/100KHz A 2.2 KV line to earth / ±1 KV line to line A 0.15 to 80MHz, 10V, 80% AM A 30A/m, 60 Hz. A 0% UT, 0.5 cycles, 0° 100/240V A/A 0% UT, 10/12 cycles, 0° 100/240V A/A 10% UT, 10/12 cycles, 0° 100/240V B/A 0% UT, 25/30 cycles, 0° 100/240V B/A Class B Class B
Temperature Coefficient GENE Means of Protection Primary to Secondary Primary to Ground Secondary to Ground Dielectric Strength _(8,9) Reinforced Insulation Basic Insulation Operational Insulation Leakage Current Earth Leakage Touch Current Power Fail Signal ₍₁₄₎ Remote Inhibit (optional) Remote Sense ₍₁₀₎ Mean-Time Between Failures Weight EMC SPECIFICATION Electrostatic Discharge Radiated Electromagnetic Field Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips Voltage Interruptions Radiated Emissions	Outputs 1 – 4: FRAL SPECII: 2MOPP (Means 1MOPP (Means 1MOPP (Means 0perational Insul 1MOPE) 5656 VDC, Prima 2121 VDC, Prima 707 VDC, Secons 100,004 NC, <500 (Means 1MOPE) Contact closure in 250mV compens 100,000 Hours mainimum prior to 100,000 Hours mainimum 1.15 Lbs. Open 1MOPE (IEC 60601-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	0.02%/°C FICATIONS of Patient Protection) of Patient Protection) ation(Consult factory for 1MOOP or 1MOPP) ary to Secondary ary to Ground 100μA SFC 0μA SFC 0μA SFC 0μt power failure 10 ms 00tput 1 dropping 1% nhibits all outputs ation of output cable losses slin., MIL-HDBK-217F, 25° C, GB Frame/ 1.82 Lbs. Chassis and Cover 2:2014, 4 TH ed./IEC 61000-6-2:2005) ±8KV contact / ±15KV air discharge A 80MHz-2.7GHz, 10V/m, 80% AM A ±2 KV, 5KHz/100KHz A ±2 KV line to earth / ±1 KV line to line A 0.15 to 80MHz, 10V, 80% AM A 30A/m, 60 Hz. A 0% UT, 0.5 cycles, 0° 100/240V A/A 0% UT, 10/12 cycles, 0° 100/240V B/A 0% UT, 25/30 cycles, 0° 100/240V B/B Class B

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

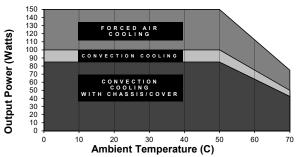


ALL DIMENSIONS IN INCHES (mm)

APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 150W, 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.
- 8. 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 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 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 100W with convection cooling or 150W with forced-air cooling on open frame models except where noted.
- Total power must not exceed 85W with convection cooling or 150W with forced-air cooling and Chassis/Cover option.
- 18. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
- 19. Total current from Outputs 1 & 2 must not exceed 15A with convection cooling.
- 20. Rated 12A maximum with convection cooling.

21. Rated 20A 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	6-32 screw down terminal mates with #6 ring tongue
	(Single)	terminal. (10 in-lb max)
P2	DC Output	0.156 friction lock header mates with Molex 09-50-3141 or equivalent
	(Multiple)	crimp terminal housing with Molex 2478 or equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	Remote/P.F./	0.100 friction lock header mates with Molex 50-57-9008or equivalent
	Sense	crimp terminal housing with Molex type 71851 or equivalent crimp
	(Single)	terminal.
P3	P.F./Sense	0.100 breakaway header mates with Molex 22-55-2061 or equivalent
	(Multiple)	crimp terminal housing with Molex type 70058 or equivalent crimp
		terminal.
P4	Remote	0.100 breakaway header mates with Molex 50-57-9002 or equivalent
	(Multiple)	crimp terminal housing with Molex type 71851 or equivalent crimp terminal.

185 WATTS

FEATURES:

- 2 Year Warranty
- Universal 85-264V Input
- One to Four Outputs

- IEC 60601-1 3rd ed. Medical Cert.
- Compact 4.2" x 7.0" x 1.5" Size IEC 60950-1 2nd ed. ITE Certification
 - IEC 60601-1-2 4th ed. EMC
 - Class B Emissions per EN55011/32
 - RoHS Compliant
- High Efficiency
 Optional Remote Inhibit/Enable
 O-70°C Operating Temperature
 Optional Chassis/Cover



CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS					
c FL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012			
IECEE SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2 nd Edition IEC 60601-1:2005/A1:2012			
c 911 us	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	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013			
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)			

MODEL LISTING

MODEL NO.	OUTPUT 1 ₍₂	1) 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

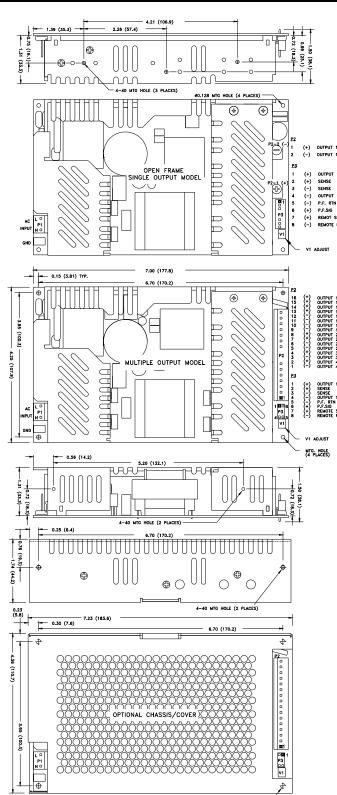
REL-185

	PUT SPECIF	
Total Output Power at 50°C ₍₁₎	135W	Convection Cooled ₍₁₆₎₍₁₈₎
(See Derating Chart) Output Voltage Centering	185W Output 1:	Forced-Air Cooled ₍₁₅₎₍₁₇₎₍₁₉₎ ± 0.5% (All outputs at 50% load)
output voltage contenting	Output 2:	± 5.0%
	Output 3:	± 5.0%
	Output 4:	± 5.0%
Output Voltage Adjust Range	Output 1:	95 - 105%
Load Regulation	Output 1:	0.5% (10-100% load change)
	Output 2: (4001,4,5, 2001)	5.0% (10-100% load change) 10.0% (20-100% load change)
	(4002,4003)	15.0% (20-100% load change)
	Output 3:	5.0% (10-100% load change)
	Output 4:	5.0% (10-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%
Cross Regulation Output Noise	Outputs 2 – 4: Outputs 1 – 4:	6.0% 1.0%
Turn on Overshoot	None	1.076
Transient Response	Outputs 1 – 4	
Voltage Deviation	5.0%	
Recovery Time	500μS	
Load Change	50% to 100%	4400/ 1 4500/
Output Overvoltage Protection Output Overpower Protection	Output 1:	110% to 150%
Hold Up Time	16ms min., Full F	Pout, cycle on/off, auto recovery
Start Up Time	5 Seconds, 120V	
	UT SPECIFIC	CATIONS
Protection Class	I	
Source Voltage	85 – 264 Volts A	C
Frequency Range	47 – 63 Hz	
Peak Inrush Current	40A	D 220V
Efficiency Power Factor	0.95 (Full Power,	Power, 230V, varies by model
FNVIRON	MENTAL SP	ECIFICATIONS
Ambient Operating	0°C to + 70°C	Lon Ioano
Temperature Range	Derating: See Po	wer Rating Chart
Ambient Storage Temp. Range	- 40°C to + 85°C	
Temperature Coefficient	Outputs 1 – 4:	0.02%/°C
	RAL SPECIF	-ICATIONS
Means of Protection	2MODD (Moone	of Dationt Protoction)
Primary to Secondary Primary to Ground		of Patient Protection) of Patient Protection) (1MOOP- Singles)
Secondary to Ground		ation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength _(8, 9)		, , , , , , , , , , , , , , , , , , , ,
Reinforced Insulation	5656 VDC, Prima	
Basic Insulation	2121 VDC, Prima	
Operational Insulation Leakage Current	707 VDC, Seco	ndary to Ground
Earth Leakage	<300µA NC, <10	00uA SEC
Touch Current	<100µA NC, <50	0μA SFC
Power Fail Signal ₍₁₄₎	Logic low with inp	out power failure 10 ms
		Output 1 dropping 1%
Remote Inhibit (optional)	Contact closure in	
Remote Sense ₍₁₀₎ Mean-Time Between Failures		ation of output cable losses in., MIL-HDBK-217F, 25° C, GB
Weight	1.70 Lbs. Open	
		2:2014, 4 TH ed./IEC 61000-6-2:2005)
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge
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
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
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.
Voltage Dips	EN 61000-4-11	0% U _T , 0.5 cycles, 0-315° 100/240V A/A 0% U _T , 1 cycles, 0° 100/240V A/A
		0% U _T , 1 cycles, 0° 100/240V A/A 40% U _T , 10/12 cycles, 0° 100/240V B/A
		70% U _T , 25/30 cycles, 0° 100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U _T , 300 cycles, 0° 100/240V B/E
	EN 55011/32	Class B
Conducted Emissions	EN 55011/32	Class B
Radiated Emissions Conducted Emissions Harmonic Current Emissions Voltage Fluctuations/Flicker		

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



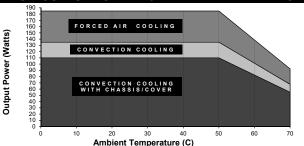
ALL DIMENSIONS IN INCHES (mm)

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.
- 8. 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.
- 18. Total power must not exceed 110W with convection cooling and Chassis/Cover option.
- 19. Total power must not exceed 185W with 300LFM forced-air cooling and Chassis/Cover
- 20. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
- 21. Total current from Outputs 1 & 2 must not exceed 20A with convection cooling.
- 22. Rated 15A maximum with convection cooling.

23. 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 50-57-9008or 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

- 2 Year Warranty
- Universal 85-264V Input
- 1-4 Tightly-Regulated Outputs
- High Efficiency
- 0-70°C Operating Temperature
- RoHS Compliant

- IEC 60601-1 3rd ed. Medical Cert.
- Compact 4.0" x 7.0" x 1.75" Size IEC 60950-1 2nd ed. ITE Certification
 - IEC 60601-1-2 4th ed. EMC
 - Class B Emissions per EN55011/32 • Optional Remote Inhibit/Enable
 - Optional Power Fail Warning
 - Optional Perforated Cover



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	SAFETY SPEC	CIFICATIONS
c 711 us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 201 2
IECEE SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c 711 us	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	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)

	MO)D	EL	LIST	ING
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MODEL NO.	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
CE-150-4001	+3.3V/15A	+5V/5A	+12V/2A	-12V/2A
CE-150-4002	+5V/15A	+3.3V/5A	+12V/2A	-12V/2A
CE-150-4003	+5V/15A	+3.3V/5A	+15V/2A	-15V/2A
CE-150-4004	+5V/15A	-5.2V/5A	+12V/2A	-12V/2A
CE-150-4005	+5V/15A	-5.2V/5A	+15V/2A	-15V/2A
CE-150-4006	+5V/15A	+12V/5A	+12V/2A	-12V/2A
CE-150-4007	+5V/15A	+12V/5A	+15V/2A	-15V/2A
CE-150-4008	+15V/5A	-15V/5A	24V/1A	24V/1A
CE-150-4009	+5V/15A	+12V/5A	+15V/2A	-12V/2A
CE-150-4011	+5V/15A	+12V/5A	-5V/1A	-12V/1A
CE-150-4101	+5V/15A	+24V/5A	+12V/2A	-12V/2A
CE-150-4102	+5V/15A	+24V/5A	+15V/2A	-15V/2A
CE-150-4103IT	+5V/15A	+24V/5A(6ApK)	+12V/2A	-12V/2A
CE-150-3001	+5V/15A	+12V/5A		-12V/2A
CE-150-3002	+5V/15A	+15V/5A		-15V/2A
CE-150-3003	+15V/5A	-15V/5A	+5V/2A	
CE-150-3004	+5V/15A	+15V/5A	+36V/2.5A	
CE-150-2001	+12V/7.5A	-12V/5A		
CE-150-2002	+15V/5A	-15V/5A		
CE-150-2003	+5V/15A	+12V/6A		
CE-150-2101	+5V/15A	+24V/5A		
CE-150-1001	3.3V/30A(18)			
CE-150-1002	5V/30A(18)			
CE-150-1003	12V/12.5A			
CE-150-1004	15V/10A			
CE-150-1005	24V/6.25A			
CE-150-1006	28V/5.4A			
CE-150-1007	48V/3.1A			

ORDERING INFORMATION

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

OVP – Overvoltage Protection I/O – Isolated Outputs CO - Cover PF - Power Fail TS - Terminal Strip RE - Remote Inhibit

	PUT SPECIF		
Total Output Power ₍₁₎	100W 125W	Convection	n Cooled ₍₁₆₎ n Cooled, w/1Sq. ft. Baseplate ₍₁₇₎
(See Derating Chart)	150W	300LEM E	Forced-Air Cooled(15)
Output Voltage Centering	Output 1:	± 0.25%	(All outputs at 50% load)
output totage contouring	Output 2:	±0.25%	$(X0XX)$, $\pm 3.0\%$ $(X1XX)$
	Output 3:	± 2.0%	(1070), 20.070 (1170)
	Output 4:	± 2.0%	
Output Voltage Adjust Range	Outputs 1 –2:	95-105%	(X0XX)
, , , ,	Output 1:	95-105%	(X1XX)
	Output 1:	85-105%	
	Output 2:	85-105%	
Load Regulation	Output 1:	0.5%	(0-100% load change)
	Output 2: (XOXX)	0.5%	(0-100% load change)
	(X1XX)	3.0%	(10-100% load change)
	Output 3:	2.0%	(10-100% load change)
	Output 4:	2.0%	(0-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%	,
Cross Regulation	Output 2:	0.2%	(X0XX)
(Output 1 load varied 50-100%)		5.0%	(X1XX)
	Output 3:	2.0%	(Output 1 load
Outer t Note :	Output 4:	2.0%	varied 50-100%)
Output Noise	Outputs 1 - 4:	1.0%	
Turn on Overshoot Transient Response	None Outputs 1 4		
Voltage Deviation	Outputs 1 – 4 5.0%		
Recovery Time	5.0% 500μS		
Load Change	50% to 100%		
Output Overvoltage Protection	Output 1:	110% to 1	150%.
(Optional)	·	Shuts dov	wn all outputs. Cycle input
		to restart	
Output Overpower Protection	165 W Min., Out		
	Outpute avalage	aloff outors	
	Outputs cycle or		ecovery
Output Overcurrent Protection	110% Min., Outp	outs 3 and 4	•
Hold Up Time	110% Min., Outp 20mS min., 150V	outs 3 and 4	•
Hold Up Time Start Up Time	110% Min., Outp 20mS min., 150V 3 Seconds	outs 3 and 4 W, 120V Inp	ut
Hold Up Time Start Up Time INPU	110% Min., Outp 20mS min., 150V 3 Seconds JT SPECIFIO	outs 3 and 4 W, 120V Inp	ut
Hold Up Time Start Up Time INP Protection Class	110% Min., Outp 20mS min., 150V 3 Seconds UT SPECIFIC	outs 3 and 4 W, 120V Inp	ut
Hold Up Time Start Up Time INPO Protection Class Source Voltage	110% Min., Outp 20mS min., 150V 3 Seconds JT SPECIFI 1 85 – 264 Volts A	outs 3 and 4 W, 120V Inp	ut
Hold Up Time Start Up Time INP Protection Class Source Voltage Frequency Range	110% Min., Outp 20mS min., 150V 3 Seconds UT SPECIFIC	outs 3 and 4 W, 120V Inp	ut
Hold Up Time Start Up Time INP Protection Class Source Voltage Frequency Range	110% Min., Outp 20mS min., 150V 3 Seconds JT SPECIFI 1 85 – 264 Volts A	outs 3 and 4 W, 120V Inp	ut
Hold Up Time Start Up Time INPO Protection Class Source Voltage Frequency Range Source Current True RMS Peak Inrush	110% Min., Outp 20mS min., 150V 3 Seconds UT SPECIFIO 1 85 - 264 Volts A 47 - 63 Hz 3A at 85V Input 30A	outs 3 and 4 N, 120V Inp CATION	ut
Hold Up Time Start Up Time INP Protection Class Source Voltage Frequency Range Source Current True RMS Peak Inrush Peak Repetitive	110% Min., Outp 20mS min., 150V 3 Seconds UT SPECIFIC 1 85 - 264 Volts A 47 - 63 Hz 3A at 85V Input 30A 4.25A at 85V Inp	outs 3 and 4 N, 120V Inp CATION	ut
Hold Up Time Start Up Time INP Protection Class Source Voltage Frequency Range Source Current True RMS Peak Inrush Peak Repetitive Harmonic Distortion	110% Min., Outp 20mS min., 150V 3 Seconds UT SPECIFIC 1 85 - 264 Volts A 47 - 63 Hz 3A at 85V Input 30A 4.25A at 85V Inp 0.05	outs 3 and 4 N, 120V Inp CATION	ut
Hold Up Time Start Up Time INP Protection Class Source Voltage Frequency Range Source Current True RMS Peak Inrush Peak Repetitive Harmonic Distortion Efficiency	110% Min., Outp 20mS min., 150V 3 Seconds UT SPECIFIC 1 85 - 264 Volts A 47 - 63 Hz 30A 4.25A at 85V Input 30D 0.05 0.68-0.80(varies	euts 3 and 4 N, 120V Inp CATION C but by model)	ut
Hold Up Time Start Up Time INP Protection Class Source Voltage Frequency Range Source Current True RMS Peak Inrush Peak Repetitive Harmonic Distortion Efficiency Power Factor	110% Min., Outp 20mS min., 150V 3 Seconds UT SPECIFIC 1 85 - 264 Volts A 47 - 63 Hz 3A at 85V Input 30A 4.25A at 85V Inp 0.05 0.68-0.80(varies 0.90 (150 W, 230	outs 3 and 4 N, 120V Inp CATION C by model)	ut S
Hold Up Time Start Up Time INP Protection Class Source Voltage Frequency Range Source Current True RMS Peak Inrush Peak Repetitive Harmonic Distortion Efficiency Power Factor ENVIRONI	110% Min., Outp 20mS min., 150V 3 Seconds UT SPECIFIC 1 85 - 264 Volts A 47 - 63 Hz 3A at 85V Input 30A 4.25A at 85V Inp 0.05 0.68-0.80(varies 0.90 (150 W, 230 MENTAL SP	outs 3 and 4 N, 120V Inp CATION C by model)	ut S
Hold Up Time Start Up Time INP Protection Class Source Voltage Frequency Range Source Current True RMS Peak Inrush Peak Repetitive Harmonic Distortion Efficiency Power Factor ENVIRONI Ambient Operating	110% Min., Outp 20mS min., 150V 3 Seconds UT SPECIFIC 1 85 – 264 Volts A 47 – 63 Hz 3A at 85V Input 30A 4.25A at 85V Inp 0.05 0.68-0.80(varies 0.90 (150 W, 230 MENTAL SP 0°C to + 70°C	couts 3 and 4 N, 120V Inp	ATIONS
Hold Up Time Start Up Time INP Protection Class Source Voltage Frequency Range Source Current True RMS Peak Inrush Peak Repetitive Harmonic Distortion Efficiency Power Factor ENVIRONI Ambient Operating Temperature Range	110% Min., Outp 20mS min., 150V 3 Seconds UT SPECIFIC 1 85 – 264 Volts A 47 – 63 Hz 3A at 85V Input 30A 4.25A at 85V Inp 0.05 0.68-0.80(varies 0.90 (150 W, 230) MENTAL SP 0°C to + 70°C Derating: See Po	cation Cation Cation Cation C by model) by model) by model by model by model by model	ATIONS
Hold Up Time Start Up Time INP Protection Class Source Voltage Frequency Range Source Current True RMS Peak Inrush Peak Repetitive Harmonic Distortion Efficiency Power Factor ENVIRONI Ambient Operating Temperature Range Ambient Storage Temp. Range	110% Min., Outp 20mS min., 150V 3 Seconds UT SPECIFIC 1 85 - 264 Volts A 47 - 63 Hz 3A at 85V Input 30A 4.25A at 85V Inp 0.05 0.68-0.80(varies 0.90 (150 W, 230 WENTALSP 0°C to + 70°C Derating: See Pc - 40°C to + 85°C	outs 3 and 4 N, 120V Inp CATION C by model) DV) IECIFIC	ATIONS Chart
Hold Up Time Start Up Time INP Protection Class Source Voltage Frequency Range Source Current True RMS Peak Inrush Peak Repetitive Harmonic Distortion Efficiency Power Factor ENVIRONI Ambient Operating Temperature Range Ambient Storage Temp. Range Temperature Coefficient	110% Min., Outp 20mS min., 150v 3 Seconds UT SPECIFIC 1 85 – 264 Volts A 47 – 63 Hz 3A at 85V Input 30A 4.25A at 85V Input 30B 0.05 0.68-0.80(varies 0.90 (150 W, 230 WENTAL SP 0°C to + 70°C Derating: See Por - 40°C to + 85°C Outputs 1 – 4:	outs 3 and 4 N, 120V Inp CATION C but by model) OV) CECIFIC Ower Rating C 0.02%	ATIONS Chart
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All specifications are maximum at $25^{\circ}\text{C}/150\text{W}$ unless otherwise stated, may vary by model and are subject to change without notice.

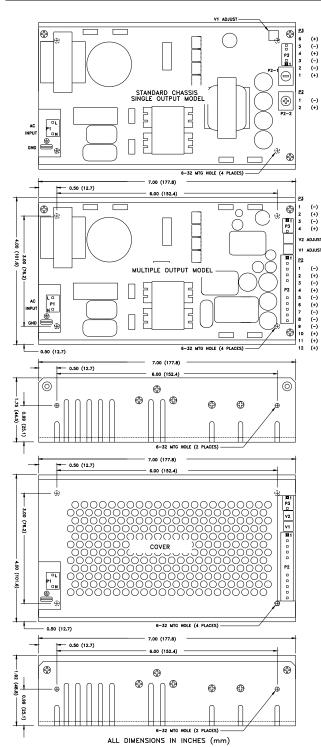


EMC SPECIFICATIONS	(IEC 60601-1-2	2:2014, 4 TH ed./IEC 61000-6-2:2005)
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge A
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM A
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz A
Surge Immunity	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 _T , 0.5 cycles, 0-315° 100/240V A/A
		0% U _T , 1 cycles, 0° 100/240V A/A
		40% U _T , 10/12 cycles, 0° 100/240V B/A
		70% U _T , 25/30 cycles, 0° 100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U _T , 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

CE-150 SERIES MECHANICAL SPECIFICATIONS

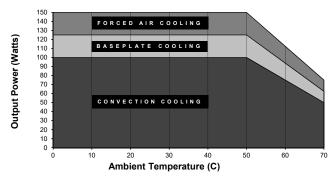
OUTPUT

OUTPUT 4
OUTPUT 3
OUTPUT 3
OUTPUT 2
OUTPUT 2
OUTPUT 1
OUTPUT 1
OUTPUT 1
OUTPUT 1
OUTPUT 1



APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 100, 125 or 150W, 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.
- 8. 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 UL60601-1 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.
- 11. Maximum screw penetration into chassis mounting holes is 0.250 inches.
- 12. 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 10ms prior to loss of output from AC failure, 5V/10mA.
- 15. Forced-Air cooling rating of 150W requires an air speed of 300LFM flowing past a point one inch above the main isolation transformer.
- 16. Free-Air convection cooling, 100W maximum output power.
- Baseplate-cooled rating of 125W requires a one-square-foot 0.09"-thick aluminum area attached to bottom four mounting holes.
- 18. Rated 20A maximum when convection cooled only



		CONNECTOR SPECIFICATIONS
P1	AC Input	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.
P2	DC Output	6-32 screw down terminal mates with #6 ring tongue
	(Single)	terminal. (10 in-lb max)
P2	DC Output (Multiple)	0.156 friction lock header mates with Molex 09-50-3121 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	Option/Sense (Single)	0.100 friction lock header mates with Molex 22-01-2067or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.
P3	Option/Sense (Multiple)	0.100 friction lock header mates with Molex 22-01-2047or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.

- 2 Year Warranty
- Universal 85-264V Input
- 1-4 Tightly-Regulated Outputs
- High Efficiency
- 0-70°C Operating Temperature
- IEC 60601-1 3rd ed. Medical Cert.
- Compact 4.75 x 8.0" x 2.0" Size
 IEC 60950-1 2nd ed. ITE Certification
 - IEC 60601-1-2 4th ed. EMC
 - Class B Emissions per EN55011/32
 - Optional Remote Inhibit/Enable Optional Power Fail Warning

 - Optional Perforated Cover



CHASSIS	ICOVED
CHASSIS	COVER

OPEN CHASSIS

	SAFETY SPEC	CIFICATIONS
c FL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c FLL us	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
TÜV	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)
	MODEL	ISTING

			S		

MODEL NO.	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
CE-225-4001	+3.3V/25A(16)	+5V/8A(16)	+12V/2A	-12V/2A
CE-225-4002	+5V/25A(16)	+3.3V/8A(16)	+12V/2A	-12V/2A
CE-225-4003	+5V/25A(16)	+3.3V/8A(16)	+15V/2A	-15V/2A
CE-225-4004	+5V/25A(16)	-5.2V/8A(16)	+12V/2A	-12V/2A
CE-225-4005	+5V/25A(16)	-5.2V/8A(16)	+15V/2A	-15V/2A
CE-225-4006	+5V/25A(16)	+12V/8A(16)	+12V/2A	-12V/2A
CE-225-4007	+5V/25A(16)	+12V/8A(16)	+15V/2A	-15V/2A
CE-225-4008	+5V/25A(16)	+12V/8A(16)	+9V/2A	-9V/2A
CE-225-4101	+5V/25A(16)	+24V/8A(16)	+12V/2A	-12V/2A
CE-225-4102	+5V/25A(16)	+24V/8A(16)	+15V/2A	-15V/2A
CE-225-4104	+24V/6A(16)	+24V/3A(16)	+12V/2A	5V/2A
CE-225-3001	+5V/25A(16)	+12V/8A(16)		-12V/2A
CE-225-3002	+5V/25A(16)	+15V/8A(16)		-15V/2A
CE-225-2001	+12V/10A(16)	-12V/8A(16)		
CE-225-2002	+15V/10A(16)	-15V/8A(16)		
CE-225-2003	+5V/25A(16)	+12V/8A(16)		
CE-225-2004	+5.2V/30A(16)	-9V/6A		
CE-225-2005	+3.3V/25A(16)	+12V/8A(16)		
CE-225-2101	+5V/25A(16)	+24V/8A(16)		
CE-225-1001	3.3V/45A(17)			
CE-225-1002	5V/45A(17)			
CE-225-1003	12V/18.8A(16)			
CE-225-1004	15V/15A(16)			
CE-225-1005	24V/9.4A(16)			
CE-225-1006	28V/8A(16)			
CE-225-1007	48V/4.7A(16)			
CE-225-1008	48V/4.7A(16)			
CE-225-1009	39V/5.8A ₍₁₆₎			

ORDERING INFORMATION

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

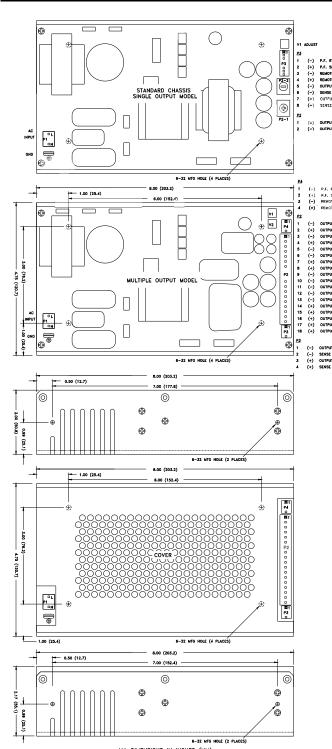
CO - Cover PF - Power Fail TS - Terminal Strip OVP - Overvoltage Protection I/O – Isolated Outputs RE - Remote Inhibit

	OL Z	
Total Output Power ₍₁₎	PUT SPECIF 150W	Convection Cooled ₍₁₈₎
(See Derating Chart)	225W	300LFM Forced-Air Cooled ₍₁₅₎
Output Voltage Centering	Output 1:	± 0.25% (All outputs at 50% load)
, ,	Output 2:	$\pm 0.25\%$ (X0XX), $\pm 5.0\%$ (X1XX)
	Output 3:	± 2.0%
	Output 4:	± 2.0%
Output Voltage Adjust Range	Outputs 1-2:	95 - 105% (X0XX)
	Output 1:	95 - 105% (X1XX)
	Output 1: Output 2:	85 - 105% (1001, 4001) 85 - 105% (4002, 4003)
Load Regulation	Output 1:	0.5% (10-100% load change)
	Output 2:	(
	(XOXX)	0.5% (0-100% load change)
	(XIXX)	5.0% (10-100% load change)
	Output 3:	2.0% (0-100% load change)
Source Regulation	Output 4: Outputs 1 – 4:	2.0% (0-100% load change) 0.5%
Cross Regulation	Outputs 2:	0.2% (X0XX), 0.5% (X1XX)
oross regulation	Output 3:	2.0%
	Output 4:	2.0%
Output Noise	Outputs 1 - 4:	1.0%
Turn on Overshoot	None	
Transient Response	Outputs 1 – 4	
Voltage Deviation Recovery Time	5.0%	
Load Change	500μS 50% to 100%	
Output Overvoltage Protection	Output 1:	110% to 150%
(Optional)	Shuts down all o	
	Cycle input to re-	start
Output Overpower Protection	250 W Min., Out	
		n/off, auto recovery
Output Overcurrent Protection	110% Min., Outp	
Hold Up Time Start Up Time	3 Seconds	V Output, 120V Input
Start op Tille	UT SPECIFI	CATIONS
Protection Class		SATIONS
Source Voltage	85 – 264 Volts A	С
Frequency Range	47 – 63 Hz	
Source Current		
True RMS	4.25A at 85V Inp	put
Peak Inrush	30A	
Peak Repetitive Harmonic Distortion	6.0A at 85V Inpu 0.05	II
Efficiency	0.68-0.80 (varies	s by model)
Power Factor	0.92 (225 Watts,	
		PECIFICATIONS
Ambient Operating	0°C to + 70°C	
Temperature Range	Derating: See Po	ower Rating Chart
Ambient Storage Temp. Range	- 40°C to + 85°C	
Temperature Coefficient	Outputs 1 – 4:	0.02%/°C
	ERAL SPECI	FICATIONS
Means of Protection	014000 /14	(0" 10 1 ")
Primary to Secondary	2MOPP (Means	of Patient Protection) of Patient Protection)
Primary to Ground Secondary to Ground		lation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength _(8, 9)	Operationalina	dation(consultractory or five or or five in
Reinforced Insulation	5656 VDC, Prim	ary to Secondary
Basic Insulation	2121 VDC, Prim	ary to Ground
Operational Insulation	707 VDC, Seco	ndary to Ground
Leakage Current	2004 NO 44	200114 SEC
Earth Leakage Touch Current	<300µA NC, <10	
Power Fail Signal (optional) ₍₁₄₎	<100µA NC, <50	put power failure 10ms
i ovioi i ali olgilai (optioliai)(14)	minimum prior to	Output 1 dropping 1%
Remote Inhibit (optional)	Contact closure	inhibits all outputs
Remote Sense(10)	250mV compens	sation of output cable losses
Mean-Time Between Failures	100,000 Hours n	nin., MIL-HDBK-217F, 25° C, GB
Weight	3.00 Lbs.	

All specifications are maximum at 25°C/225W unless otherwise stated, may vary by model and are subject to change without notice.

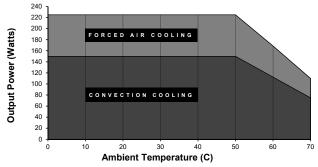
EMC SPECIFICATIONS	(IEC 60601-1-2	2:2014, 4 TH ed./IEC 61000-6-2:200	5)
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge	Α
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM	Α
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz	Α
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to line	Α
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM	Α
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.	Α
Voltage Dips	EN 61000-4-11	0% U _T , 0.5 cycles, 0-315° 100/240V	A/A
		0% U _T , 1 cycles, 0° 100/240V	A/A
		40% U _T , 10/12 cycles, 0° 100/240V	B/A
		70% U _T , 25/30 cycles, 0° 100/240V	B/A
Voltage Interruptions	EN 61000-4-11	0% U _T , 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	

CE-225 SERIES MECHANICAL SPECIFICATIONS



APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 150 or 225W, 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.
- 8. 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.
- 11. Maximum screw penetration into chassis mounting holes is 0.250 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 10ms prior to loss of output from AC failure, 5V/10mA.
- Forced-Air cooling rating of 225W requires an air speed of 300LFM flowing past a point one inch above the main isolation transformer.
- 16. Derated 20% when convection cooled.
- 17. Rated 30A maximum when convection cooled only.
- 18. Free-Air convection cooling, 150W maximum output power.



	(CONNECTOR SPECIFICATIONS
	AC Input	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.
P2	DC Output (Single)	6-32 screw down terminal mates with #6 ring tongue terminal.
P2	DC Output (Multiple)	0.156 friction lock header mates with Molex 09-50-3181 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	Option/Sense (Single)	0.100 friction lock header mates with Molex 22-01-2087or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.
P3/P4	Option/Sense (Multiple)	0.100 friction lock header mates with Molex 22-01-2047or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.

MULTI OUTPUT AC-DC

FEATURES:

- Compact 4.0" x 7.0" x 1.5" Size
- 3 Year Warranty
- · Universal 85-264V Input
- 2-4 Regulated & Adjustable Outputs
- 90% Peak/87% Average Efficiency
- <300mW No Load Input Power
- -20 to +70°C Operating Temperature
- RoHS Compliant

- IEC 60601-1 3rd ed. Medical Cert.
 IEC 60950-1 2nd ed. ITE Certification
 IEC 62368-1 2nd ed. Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN55011/32
- Optional 5V/2A Standby Output
- Optional Remote Inhibit/Enable
- Optional Chassis/Cover



SAFETY SPECIFICATIONS



MODEL LISTING					
MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4	
NXT-400M-4001	+3.3V/50A	+3.3-5V/15A	+12-15V/5A	-12-15V/5A	
NXT-400M-4002	+5V/50A	+3.3-5V/15A	+12-15V/5A	-12-15V/5A	
NXT-400M-4003	+5V/50A	+12-15V/10A	+12-15V/5A	-12-15V/5A	
NXT-400M-4004	+5V/50A	+24-28V/5A	+12-15V/5A	-12-15V/5A	
NXT-400M-4005	+24V/12.5A	-24-28V/5A	+12-15V/5A	-12-15V/5A	
NXT-400M-3001	+5V/50A	+12-15/10A		-12-15V/5A	
NXT-400M-2001	+5V/50A	+24-28V/5A			
NXT-400M-2002	+5V/50A	+12-15V/10A			
NXT-400M-2003	+12V/25A	-12-15V/10A			
NXT-400M-2004	+15V/20A	-12-15V/10A			

ORDERING INFORMATION

Consult factory for alternate output configurations. Please specify output voltage set points when ordering. Please specify the following optional features when ordering:

CH-Chassis I/O-Isolated Outputs PF-Power Fail Warning CO-Cover RE/SB- Remote Inhibit/Standby Output BF-Type BF

All specifications are maximum at 25°C, 400W unless otherwise stated, may vary by model and are subject to change without notice.

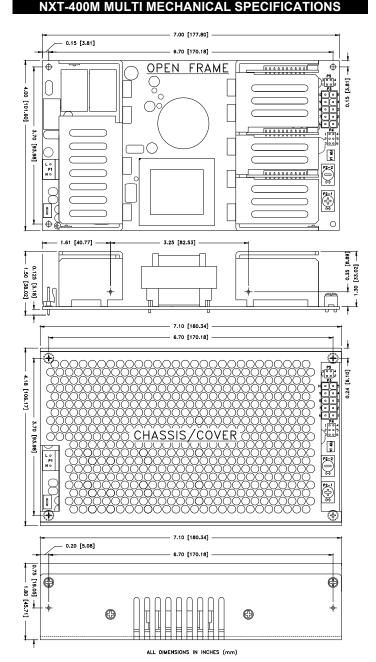
OUTP	UT SPECI	FICATION	IS	
Output Power at 50°C ₍₁₎	200W	Convection (Cooled, Open Frame	
(See Derating Chart)	400W	300LFM For	ced-Air Cooled, Open Frame	
Voltage Centering	Outputs 1-4:	±0.5%	(All outputs at 50% load)	
Voltage Adjust Range	Outputs 1:	95-105%		
	Outputs 2-4:	90-110%(2)		
Load Regulation	Outputs 1:	±0.2%	(0-100% load change) ₍₄₎	
	Outputs 2-4:	±1.0%	(0-100% load change)	
Source Regulation	Outputs 1-4:	0.2%		
Cross Regulation	Outputs 2-4:	0.2%		
Ripple & Noise	Outputs 1-4	1.0% or 100	mV 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, 1ms maximum, 4%			
	maximum devia			
Overvoltage Protection	Latching, Outpu	ut 1, 110% and	150% of rated output Voltage	
Overpower Protection	110%-150% rat	ted Роит, cycle	off/on, auto recovery.	
Hold-Up Time	16ms minimum	, full power.		
Start-Up Time	<1 sec., 115/23	0V input.		
Output Rise Time	Output 1: 5ms t	ypical. Outputs	2-4: 30ms typical.	
Minimum Load(5)	No minimum lo	ad required.		
Remote Sense ₍₉₎	Output 1: 250m	V compensation	n of output cable losses.	
Enable/Inhibit (System)(16)	Contact closure	enables all out	puts with RE/SB option.	
Enable/Inhibit (Outputs 2, 3, 4) ₍₁₇₎	Contact closure inhibits individual output.			
Standby Output	Provides 5V/2A	while all other	outputs are	
		th RE/SB option	·	

	INPUT SPECIFICATIONS
Protection Class	
Source Voltage	85 – 264 VAC (see derating chart)
Frequency Range	47 – 63 Hz
Input Protection	Dual internal 8A time delay fuses, 1500A breaking capacity
Peak Inrush Current	40A max
Peak Efficiency	Up to 90%
Average Efficiency	Up to 87% (Avg. of 25%, 50%, 75% and 100% rated load)
No Load Input Power	<300mW (with RE/SB option)
	<500mW (with RE/SB and PF option)

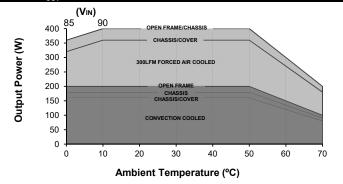
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ENVIRONM	IENTAL SPECIFICATIONS
Ambient Operating Temp. Range	-20°C to + 70°C, Derating: (see derating chart)
Ambient Storage Temp. Range	- 40°C to + 85°C
Operating Relative Humidity Range	20-90% non-condensing
Altitude	3,000m ASL Operating (5,000m consult factory)
Temperature Coefficient	0.02%/°C
Vibration (MIL-STD-810G)	2.5G swept sine, 10-2000Hz, 1 octave/min, 3 axis, 1 hour each
Shock (MIL-STD-810G)	20g, 11 ms, 3 axis.
GENE	PAL SPECIFICATIONS

GEN	ERAL 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(7, 8)			
Reinforced Insulation	5656VDC (4000VAC) (12)		
Basic Insulation	2121VDC (1500VAC) (12)		
Operational Insulation	707VDC (500VAC) ₍₁₂₎ /2121VDC (1500VAC) ₍₁₂₎ 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 10-15ms prior to AC input failure.		
Switching Frequency	PWM:133 KHz/PFC:Variable		
Mean-Time Between Failures	150,000 hours, MIL-HDBK-217F, 25°C, GB		
Weight	1.7 lb. Open frame / 2.2 lb. Chassis and cover		

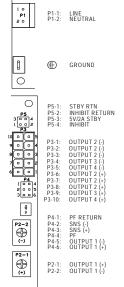
Weight	1.7 lb. Open frame / 2.2 lb. Chassis and cover			
EMC SPECIFICATION	IS (IEC 60601-1	-2:2014, 4 TH ed./IEC 61000-6-2:2	005)	
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge	Α	
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM	Α	
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz	Α	
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to lin	ie A	
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM	Α	
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.	Α	
Voltage Dips	EN 61000-4-11	0% U _T , 0.5 cycles, 0-315° 100/240	V A/A	
		0% U _T , 1 cycles, 0° 100/240'	V A/A	
		40% U _T , 10/12 cycles, 0° 100/240	√B/A	
		70% U _T , 25/30 cycles, 0° 100/240	√ B/A	
Voltage Interruptions	EN 61000-4-11	0% U _T , 300 cycles, 0° 100/240	VB/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		



MAX P_{OUT} vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



- Derate Outputs 1 (3.3-5V) current rating 40% when convection cooled
- Derate Outputs 1 (12-15V) current rating 25% when convection cooled.
- Derate Outputs 2 (3.3-15V) current rating 25% when convection cooled.
- Derate Total Output Power linearly from 100% at 50°C to 50% at 70°C.
- Derate Total Output Power linearly from 100% at 90V_{IN} to 90% at 85V_{IN} when forced-air cooled.
- Derate Total Output Power 10% when convection cooled using Chassis or Chassis/Cover
- Derate Total Output Power 20% when convection cooled using Chassis/Cover (4001, 4002 only)
- Derate Total Output Power 10% when forced-air cooled using Chassis/Cover.



P1: 0.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 80-50-0189 or equivalent crimp terminal.

Ground: 0.187 guick disconnect terminal.

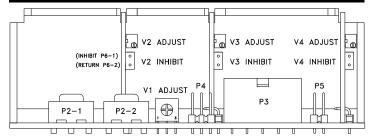
P5: 0.100 friction lock header mates with Molex 22-55-2041 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.

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

P4: 0.100 breakaway header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex type 70058 or equivalent crimp terminal.

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

OUTPUT VOLTAGE ADJUSTMENT LOCATIONS



APPLICATIONS INFORMATION

- 1. Each output can deliver its rated current but Total Output Power must not exceed 400W.
- 2. 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 5% load may be required on Output 1 when loading Outputs 2, 3 or 4 to full rated current.
- Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz.
- This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1:2005. 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 type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 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.
- 9. Remote-Sense terminals may be used to compensate for cable losses up to 250mV, depending on model. The use of a twisted pair, decoupling capacitors and an appropriatelyrated 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 10-15ms prior to loss of output from AC failure, 5V/10mA (4001:3.3V/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.
- Outputs 2, 3 and 4 are adjustable from -10% of lowest voltage rating to +10% of highest
- 16. RE/SB Option enables all outputs with a P5-4 to P5-2 switch closure, 6V Max./50mA
- Output 2, 3 and 4 Inhibit feature shuts down only the output inhibit with a P6-1 to P6-2 switch closure, 45V Max

100 WATTS

SINGLE OUTPUT AC-DC

FEATURES:

- Compact 2.5" x 4.5" x 1.0" Size
- 3 Year Warranty
- Universal 85-264V Input
- Single High Efficiency Output
- Power Fail Warning
- 0-70°C Operating Temperature
 RoHS Compliant
- 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
- Optional Single Wire Load Sharing
- Optional Remote Inhibit/Enable
- Optional Chassis/Cover





CHASSIS/COVER

OPEN FRAME

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

MODEL LISTING					
	OPEN FRAME		CHASSIS/COVER		
MODEL	300 LFM	CONVECTION COOLED	300 LFM	CONVECTION COOLED	
NXT-100-1001	2.5V/20.0A	2.5V/14.0A	2.5V/18.0A	2.5V/12.6A	
NXT-100-1002	3.3V/20.0A	3.3V/14.0A	3.3V/18.0A	3.3V/12.6A	
NXT-100-1003	5V/20.0A	5V/14.0A	5V/18.0A	5V/12.6A	
NXT-100-1004	12V/8.3A	12V/5.8A	12V/7.5A	12V/5.2A	
NXT-100-1005	15V/6.7A	15V/4.7A	15V/6.0A	15V/4.2A	
NXT-100-1006	24V/4.2A	24V/2.9A	24V/3.8A	24V/2.6A	
NXT-100-1007	28V/3.6A	28V/2.5A	28V/3.2A	28V/2.3A	
NXT-100-1008	48V/2.1A	48V/1.5A	48V/1.9A	48V/1.4A	

Please refer to Output Power Derating chart.

ORDERING INFORMATION

Consult factory for alternate output configurations. Please specify the following optional features when ordering:

CH - Chassis LSEVB - Load Share Evaluation Board CO - Cover RE - Remote Inhibit

CO - Cover LS - Single Wire Load Sharing

All specifications are maximum at 25° C/100W unless otherwise stated, may vary by model and are subject to change without notice.

NXT-100

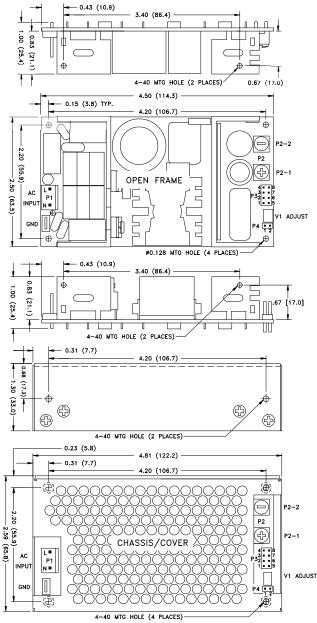
	NXT-1	00		
	UT SPECIF			
Output Power at 50°C ₍₁₎	70W	Convection Cooled, Open Frame		
(See Derating Chart)	100W	300LFM Forced-Air Cooled(15)		
Power Derating Voltage Centering	1.0 Wout / 1 Vin ± 0.5%	(50% load)		
Voltage Adjust Range	95-105%	(30 % load)		
Load Regulation	0.5%	(0-100% load change)		
Source Regulation	0.5%			
Noise	1.0% or 100mV	Whichever is greater		
Turn on Overshoot Transient Response	None Output recovers	to within 1% of initial set point due		
Transient Response		ad change, 500µS maximum,		
	4% maximum de	viation.		
Overvoltage Protection		en 110% and 150% of rated output		
Overpower Protection	voltage.	Pout, cycle on/off, auto recovery		
Hold Up Time		Power, 85-264V Input		
Start Up Time	3 Seconds, 120V	/ Input		
INPL	IT SPECIFIC	CATIONS		
Protection Class	1			
Source Voltage	85 – 264 Volts A 47 – 63 Hz	C		
Frequency Range Input Protection ₍₆₎	47 – 63 HZ Internal 2.5A Tim	ne Delay fuse		
Peak Inrush Current	50A (cold)	io Doidy 1030		
Efficiency	85% Typical, Ful	Power varies by model		
Power Factor	0.95 (Full Power,	, 230V), 0.98 (Full Power, 120V)		
		ECIFICATIONS		
Ambient Operating Femperature Range	0°C to + 70°C	ower Rating Chart		
Ambient Storage Temp. Range	- 40°C to + 85°C			
Operating Relative Humidity Range				
Altitude	10,000 ft. ASL	Operating		
	40,000 ft. ASL	Non-operating		
Temperature Coefficient	0.02%/°C	L AND CTD OLOF MAN LEGAL		
Vibration Shock	2.5g, 10Hz2KF	Hz per MIL-STD-810F Method 514.5 IL-STD-810F Method 514.5		
		FICATIONS		
Means of Protection	VAL OF LOT	IOATIONS		
Primary to Secondary		of Patient Protection)		
Primary to Ground		of Patient Protection)		
Secondary to Ground Dielectric Strength(8, 9)	Operational Insul	ation(Consult factory for 1MOOP or 1MOF		
Reinforced Insulation	5656 VDC, Prima	ary to Secondary		
Basic Insulation	2121 VDC, Prima	ary to Ground		
Operational Insulation	707 VDC, Seco	ndary to Ground		
Leakage Current Earth Leakage	-200uA NC -10	000 LA SEC		
Touch Current	<300µA NC, <10 <100µA NC, <50			
Power Fail Signal ₍₁₄₎	Logic low with in	Logic low with input power failure 10 ms minimum		
	prior to output 1	dropping 1%.		
Remote Inhibit (optional)(20)	Connection to ex	ternal 5V bias inhibits output.		
_oad Share (optional)(16, 17, 18)		nt sharing with return via negative nimum current share load is 10% of		
		utput current rating. Maximum output		
	voltage deviation	between modules is 5% for 2.5 through		
		0 mV for remaining models.		
Remote Sense(10)	400mV compens	ation of output cable losses		
Mean-Time Between Failures Weight	0.56 Lhs Onen	MIL-HDBK-217F, 25° C, GB Frame/ 0.96 Lbs. Chassis and Cover		
		-2:2014, 4 TH ed./IEC 61000-6-2:200		
Electrostatic Discharge		±8KV contact / ±15KV air discharge		
Radiated Electromagnetic Field	EN 61000-4-2			
	EN 61000-4-2 EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM		
	EN 61000-4-3 EN 61000-4-4			
Surge Immunity	EN 61000-4-3 EN 61000-4-4 EN 61000-4-5	80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line		
Surge Immunity Conducted Immunity	EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6	80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM		
Surge Immunity Conducted Immunity Magnetic Field Immunity	EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth /±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz.		
Surge Immunity Conducted Immunity Magnetic Field Immunity	EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6	80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth /±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. 0% U _T , 0.5 cycles, 0-315° 100/240V A		
Surge Immunity Conducted Immunity Magnetic Field Immunity	EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8	80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth /±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. 0% U _T , 0.5 cycles, 0-315° 100/240V A 0% U _T , 1 cycles, 0° 100/240V A		
Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips	EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-11	80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. 0% UT, 0.5 cycles, 0·315° 100/240V A 0% UT, 1 cycles, 0° 100/240V A 40% UT, 10/12 cycles, 0° 100/240V B 70% UT, 25/30 cycles, 0° 100/240V B		
Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips Voltage Interruptions	EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8 EN 61000-4-11	80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. 0% UT, 0.5 cycles, 0°315° 100/240V A 0% UT, 1 cycles, 0° 100/240V A 40% UT, 10/12 cycles, 0° 100/240V B 70% UT, 25/30 cycles, 0° 100/240V B 0% UT, 300 cycles, 0° 100/240V B		
Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips Voltage Interruptions Radiated Emissions	EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8 EN 61000-4-11 EN 61000-4-11 EN 55011/32	80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. 0% Uτ, 0.5 cycles, 0-315° 100/240V A 0% Uτ, 1 cycles, 0° 100/240V A 40% Uτ, 10/12 cycles, 0° 100/240V B 70% Uτ, 25/30 cycles, 0° 100/240V B 0% Uτ, 300 cycles, 0° 100/240V B Class B		
Electrical Fast Transients/Bursts Surge Immunity Conducted Immunity Magnetic Field Immunity Voltage Dips Voltage Interruptions Radiated Emissions Conducted Emissions Harmonic Current Emissions	EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8 EN 61000-4-11	80MHz-2.7GHz, 10V/m, 80% AM ±2 KV, 5KHz/100KHz ±2 KV line to earth / ±1 KV line to line 0.15 to 80MHz, 10V, 80% AM 30A/m, 60 Hz. 0% UT, 0.5 cycles, 0°315° 100/240V A 0% UT, 1 cycles, 0° 100/240V A 40% UT, 10/12 cycles, 0° 100/240V B 70% UT, 25/30 cycles, 0° 100/240V B 0% UT, 300 cycles, 0° 100/240V B		

EN 61000-3-3

Compliant

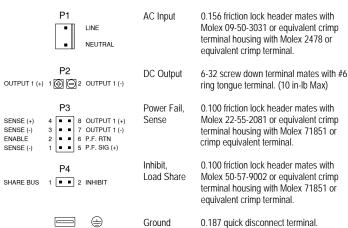
Voltage Fluctuations/Flicker

NXT-100 SERIES MECHANICAL SPECIFICATIONS



ALL DIMENSIONS IN INCHES (mm)

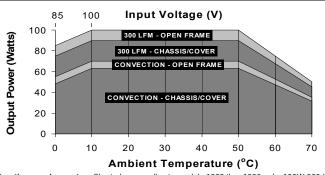
CONNECTOR SPECIFICATIONS



APPLICATIONS INFORMATION

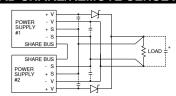
- 1. Continuous Output Power must not exceed 100W.
- Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
- Sufficient area must be provided around power supply 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), 20MHz bandwidth
- 8. 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.
- 10. 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 lowimpedance 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.
- 12. 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 10ms prior to loss of output from AC failure.
- 15. 300LFM of airflow must be maintained one inch above the top of the heatsinks in any direction in open-frame forced-air applications; and one inch above and toward any of the three perforated sides of the cover in forced-air Chassis/Cover applications.
- 16. Low forward-voltage-drop oring diodes must be used in all load-sharing applications in 2.5 through 15V models. Oring diodes must be used on 24 through 48V models used in fault-tolerant applications but are optional in power-boosting applications. Oring diode power dissipation must be subtracted from the maximum output-power rating of each model.
- 17. Current-carrying conductors in load-sharing applications must be short and symmetrical
- Refer to Load-Share Evaluation Board data sheet (page 58) for additional load-share applications information.
- 19. P3-2 Load Share Enable and P4-2 Remote Inhibit will share a common negative return pin P3-
- 20. Remote Inhibit option will require an outside TTL compatible source.

MAX P_{out} vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements – Chart above applies to models 1003 thru 1008 only. 100W 300 LFM forced air, open frame. 70W convection cooled open frame. Derate 10% with Chassis and Cover. Derate 1.0Wout / 1V_{IN} below 100V_{IN} and between 100V_{IN} and 85V_{IN}. Use larger of the two deratings when using chassis/cover below 100V_{IN}. Derate output power linearly to 50% between 50° and 70°C.

TYPICAL LOAD SHARE/REMOTE SENSE APPLICATION



- · 3 Year Warranty
- Universal 85-264V Input
- Single High Efficiency Output
- · Power Fail Warning
- 0-70°C Operating Temperature
- RoHS Compliant
- Compact 3.0" x 5.0" x 1.25" Size 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
 - . Optional Single Wire Load Sharing
 - Optional Remote Inhibit/Enable
 - Optional Chassis/Cover





CHASSIS/COVER

OPEN FRAME

UL 60950-1:2007, 2nd Edition Underwriters Laboratories r**Al**us File E137708/E140259 AAMI/ANSI ES60601-1:2005/(R) 2012 CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012 UL Recognition CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition Mark for Canada CAN/CSA-C22.2 No. 60601-1:2014 File E137708/E140259 EN 60950-1/A2:2013, 2nd Edition

SAFETY SPECIFICATIONS



TUV

Low Voltage Directive RoHS Directive (Recast) (2014/35/EU of February 2014) (2011/65/EU of June 2011)

EN 60601-1:2006/A1:2013

MODEL LISTING

	OPEN FRAME		CHASSIS/COVER	
MODEL	300 LFM	CONVECTION COOLED	300 LFM	CONVECTION COOLED
NXT-175-1001	2.5V/35.0A	2.5V/23.0A	2.5V/31.5A	2.5V/20.7A
NXT-175-1002	3.3V/35.0A	3.3V/23.0A	3.3V/31.5A	3.3V/20.7A
NXT-175-1003	5V/35.0A	5V/23.0A	5V/31.5A	5V/20.7A
NXT-175-1004	12V/14.6A	12V/9.6A	12V/13.1A	12V/8.6A
NXT-175-1005	15V/11.7A	15V/7.7A	15V/10.5A	15V/6.9A
NXT-175-1006	24V/7.3A	24V/4.8A	24V/6.6A	24V/4.3A
NXT-175-1007	28V/6.3A	28V/4.1A	28V/5.6A	28V/3.7A
NXT-175-1008	48V/3.6A	48V/2.4A	48V/3.2A	48V/2.2A

Please refer to Output Power Derating chart.

ORDERING INFORMATION

Consult factory for alternate output configurations. Please specify the following optional features when ordering:

CH - Chassis LSEVB - Load Share Evaluation Board RE - Remote Inhibit

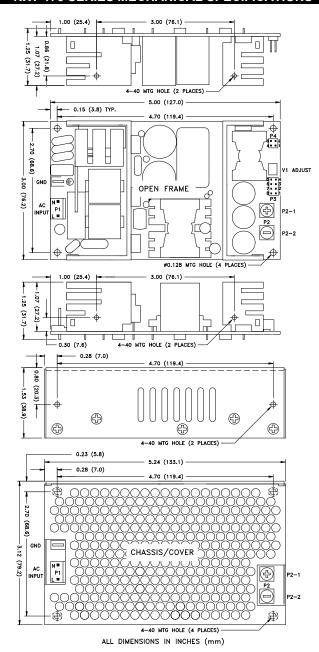
CO - Cover LS - Single Wire Load Sharing

All specifications are maximum at 25°C/175W unless otherwise stated, may vary by model and are subject to change without notice.

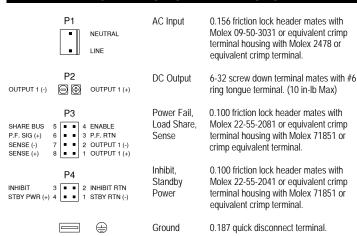
	VXT-1	13
OUTP	UT SPECIF	ICATIONS
Output Power at 50°C(1)	115W	Convection Cooled, Open Frame
(See Derating Chart)	175W	300 LFM Forced-Air Cooled ₍₁₅₎
Power Derating	1.0 Wout / 1 Vin	
Voltage Centering	± 0.5%	(50% load)
Voltage Adjust Range	95-105%	(0.1000/
Load Regulation	0.5%	(0-100% load change)
Source Regulation Noise	0.5% 1.0% or 100mV	Whichover is greater
Turn on Overshoot	None	Whichever is greater
Transient Response		to within 1% of initial set point due
Transferr Mospones		nd change, 500µS maximum,
	4% maximum de	
Overvoltage Protection	Latching, between	n 110% and 150% of rated output voltage.
Overpower Protection		Pout, cycle on/off, auto recovery
Hold Up Time		Power, 85-264V Input
Start Up Time	3 Seconds, 120V	Input
	T SPECIFIC	CATIONS
Protection Class	1	-
Source Voltage	85 – 264 Volts A	<u>C</u>
Frequency Range	47 – 63 Hz	D.I. (
Input Protection(6)	Internal 5A Time	Delay fuse
Peak Inrush Current	50A (cold)	Decree and a barrier del
Efficiency	85% Typical, Full	Power varies by model
Power Factor		230V), 0.98 (Full Power, 120V)
		ECIFICATIONS
Ambient Operating	0°C to + 70°C	(100% load)
Temperature Range	- 40°C to + 85°C	wer Rating Chart
Ambient Storage Temp. Range Operating Relative Humidity Range	20-90% non-cond	doncing
Operating Relative numicity Range Altitude		perating/ 40,000 ft. ASL Non-Operating
Temperature Coefficient	0.02%/°C	peraling/ 40,000 ft. ASL Non-Operaling
Vibration		Iz per MIL-STD-810F Method 516.5
Shock	20g, ronzzkn	L-STD-810F Method 516.5
	PAL SPECIE	FICATIONS
Means of Protection	AL OI LOII	IOATIONO
Primary to Secondary	2MOPP (Means	of Patient Protection)
Primary to Ground		of Operator Protection)
Secondary to Ground		ation (Consult factory for 1MOOP or 1MOP
Dielectric Strength(8, 9)		
Reinforced Insulation	5656 VDC, Prima	ary to Secondary
Basic Insulation	2121 VDC, Prima	
Operational Insulation	707 VDC, Seco	ndary to Ground
Leakage Current	200. A NO. 10	00. A CEC
Earth Leakage	<300µA NC, <10 <100µA NC, <50	IOUA SEC
Touch Current Power Fail Signal ₍₁₄₎		out power failure 10 ms minimum
rower rail Signal(14)	prior to output 1 o	dropping 1%
Remote Inhibit (optional)	Isolated Contact	closure inhibits output.
Load Share (optional)(16, 17, 18)	Single wire curre	nt sharing with return via negative
		nimum current share load is 10% of
	each module's ou	utput current rating. Maximum output
	voltage deviation	between modules is 5% for 2.5 through
		0 mV for remaining models.
Standby Power (optional)(19)		± 10%, 10 mA available only with Remote
	Inhibit option.	
Remote Sense(10)		ation of output cable losses
Mean-Time Between Failures		nin., MIL-HDBK-217F, 25° C, GB
Weight		Frame/ 1.37 Lbs. Chassis and Cover
		-2:2014, 4 TH ed./IEC 61000-6-2:200
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM

Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air o	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 _T , 0.5 cycles, 0-315°	100/240V A/A
		0% U _T , 1 cycles, 0°	100/240V A/A
		40% U _T , 10/12 cycles, 0°	100/240V B/A
		70% U _T , 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U _T , 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	

NXT-175 SERIES MECHANICAL SPECIFICATIONS



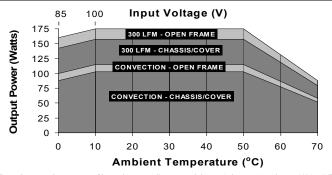
CONNECTOR SPECIFICATIONS



APPLICATIONS INFORMATION

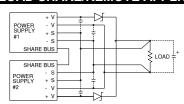
- 1. Continuous Output Power must not exceed 175W.
- Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
- Sufficient area must be provided around power supply 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), 20MHz bandwidth
- 8. 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.
- 10. 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 lowimpedance 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.
- 12. 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 10ms prior to loss of output from AC failure.
- 15. 300LFM of airflow must be maintained one inch above the top of the heatsinks in any direction in open-frame forced-air applications; and one inch above and toward any of the three perforated sides of the cover in forced-air Chassis/Cover applications.
- 16. Low forward-voltage-drop oring diodes must be used in all load-sharing applications in 2.5 through 15V models. Oring diodes must be used on 24 through 48V models used in fault-tolerant applications but are optional in power-boosting applications. Oring diode power dissipation must be subtracted from the maximum output-power rating of each model.
- 17. Current-carrying conductors in load-sharing applications must be short and symmetrical.
- Refer to Load-Share Evaluation Board data sheet (page 58) for additional load-share applications information.
- 19. A load equal to 5% rated Output Power must be maintained when using Standby Power option. An external electrolytic capacitor across standby power output may be used to improve transient response.

MAX P_{out} vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements – Chart above applies to models 1003 thru 1008 only. 175W 300LFM forced air, open frame. 115W convection cooled open frame. Derate 10% with chassis and cover. Derate 1.0Wout /1Vin below 100Vin and between 100Vin and 85Vin. Use larger of the two deratings when using chassis/cover below 100Vin. Derate output power linearly to 50% between 50° and 70°C.

TYPICAL LOAD SHARE/REMOTE APPLICATION



SINGLE OUTPUT AC-DC

FEATURES:

- Compact 3.0" x 5.0" x 1.5" Size
- 3 Year Warranty
- Universal 85-264V Input
- Single High Efficiency Output
- Power Fail Warning
- 0-70°C Operating Temperature
- RoHS Compliant
- 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
- Optional Single Wire Load Sharing
- Optional Remote Inhibit/Enable
- Optional Chassis/Cover





CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c FLI us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c 911 us	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	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING					
	OPEN	FRAME	ME CHASSIS/COVER		
MODEL	300 LFM	CONVECTION COOLED	300 LFM	CONVECTION COOLED	
NXT-225-1001	2.5V/53.0A	2.5V/30.0A	2.5V/47.7A	2.5V/27.0A	
NXT-225-1002	3.3V/53.0A	3.3V/30.0A	3.3V/47.7A	3.3V/27.0A	
NXT-225-1003	5V/45.0A	5V/30.0A	5V/40.5A	5V/27.0A	
NXT-225-1004	12V/18.8A	12V/12.5A	12V/16.9A	12V/11.3A	
NXT-225-1005	15V/15.0A	15V/10.0A	15V/13.5A	15V/9.0A	
NXT-225-1006	24V/9.4A	24V/6.3A	24V/8.5A	24V/5.7A	
NXT-225-1007	28V/8.0A	28V/5.4A	28V/7.2A	28V/4.9A	
NXT-225-1008	48V/4.7A	48V/3.1A	48V/4.2A	48V/2.8A	

MODEL LISTING

Please refer to Output Power Derating chart.

ORDERING INFORMATION

Consult factory for alternate output configurations. Please specify the following optional features when ordering:

CH - Chassis LSEVB - Load Share Evaluation Board CO - Cover RE - Remote Inhibit

LS - Single Wire Load Sharing

All specifications are maximum at $25^{\circ}\text{C}/225\text{W}$ unless otherwise stated, may vary by model and are subject to change without notice.

NXT-225

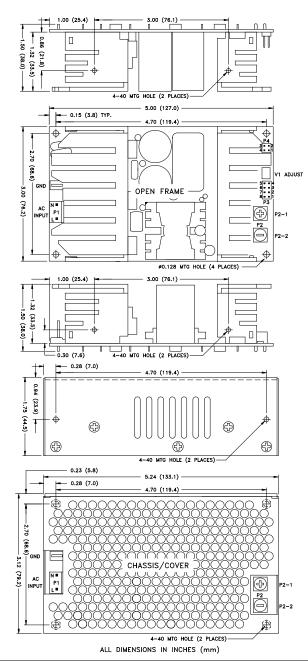
	INX I -Z	.20
OUT	PUT SPECIF	ICATIONS
Output Power at 50°C ₍₁₎	150W	Convection Cooled, Open Frame
(See Derating Chart)	225W	300LFM Forced-Air Cooled(15)
Power Derating	1.5 Wout / 1 Vin	
Voltage Centering	± 0.5%	(50% load)
Voltage Adjust Range	95-105%	
Load Regulation	0.5%	(0-100% load change)
Source Regulation	0.5%	
Noise	1.0% or 100mV	Whichever is greater
Turn on Overshoot	None	
Transient Response		to within 1% of initial set point due
	to a 50% step loa	ad change, 500µS maximum,
O	4% maximum de	
Overvoltage Protection		en 110% and 150% of rated output voltage.
Overpower Protection Hold Up Time	110-130% lateu	Pout, cycle on/off, auto recovery ower, 85-264V Input
Start Up Time	3 Seconds, 120\	
IND	UT SPECIFIC	CATIONS
Protection Class	UT SPECIFI	CATIONS
Source Voltage	85 – 264 Volts A	r
Frequency Range	47 – 63 Hz	<u> </u>
Input Protection ₍₆₎	Internal 5A Time	Delay fuse
Peak Inrush Current	50A (cold)	Doidy Tube
Efficiency		I Power varies by model
Power Factor	0.95 (Full Power	, 230V), 0.98 (Full Power, 120V)
		ECIFICATIONS
Ambient Operating	0°C to + 70°C	
Temperature Range		ower Rating Chart
Ambient Storage Temp. Range	- 40°C to + 85°C	
Operating Relative Humidity Rang		
Altitude		perating/ 40,000 ft. ALS Non-Operating
Temperature Coefficient	0.02%/°C	pg
Vibration		Iz per MIL-STD-810F Method 516.5
Shock	20g, peak per M	IL-STD-810F Method 516.5
GENE	RAL SPECI	
Means of Protection		
Primary to Secondary	2MOPP (Means	of Patient Protection)
Primary to Ground		of Operator Protection)
Secondary to Ground	Operational Insu	lation(Consult factory for 1MOOP or 1MOP
Dielectric Strength(8, 9)		
Reinforced Insulation	5656 VDC, Prim	ary to Secondary
Basic Insulation	2121 VDC, Prim	
Operational Insulation	707 VDC, Seco	ondary to Ground
Leakage Current Earth Leakage	200 A NC -10	2004 SEC
Touch Current	<300µA NC, <10	
Power Fail Signal ₍₁₄₎	<100µA NC, <50	put power failure 10 ms minimum
Power Fall Signal(14)	prior to output 1	dropping 1%
Remote Inhibit (optional)		t closure inhibits output.
Load Share (optional) _(16, 17, 18)		ent sharing with return via negative
2000 Onaro (opaonar)(10, 17, 18)		nimum current share load is 10% of
		utput current rating. Maximum output
	voltage deviation	between modules is 5% for 2.5 through !
		00 mV for remaining models.
Standby Power (optional)(19)	Isolated 5 Vdc	± 10%, 10 mA available only with Remote
	Inhibit option.	
Remote Sense(10)		sation of output cable losses
Mean-Time Between Failures		nin., MIL-HDBK-217F, 25° C, GB
Weight	0.98 Lbs. Open	Frame/ 1.50 Lbs. Chassis and Cover
		-2:2014, 4 TH ed./IEC 61000-6-2:200
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz
Surge Immunity	EN 61000-4-5	± 2 KV line to earth / ± 1 KV line to line
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.
Voltage Dips	EN 61000-4-11	0% U _T , 0.5 cycles, 0-315° 100/240V A
		0% U _T , 1 cycles, 0° 100/240V A
		40% U _T , 10/12 cycles, 0° 100/240V B
		100/ LI= 35/30 cycloc 0° 100/340\/ D
Malkana lakan - 2	EN (4000 111	70% U _T , 25/30 cycles, 0° 100/240V B
	EN 61000-4-11	0% U _T , 300 cycles, 0° 100/240V B
Radiated Emissions	EN 55011/32	0% U _T , 300 cycles, 0° 100/240V B Class B
Voltage Interruptions Radiated Emissions Conducted Emissions Harmonic Current Emissions		0% U _T , 300 cycles, 0° 100/240V B

EN 61000-3-3

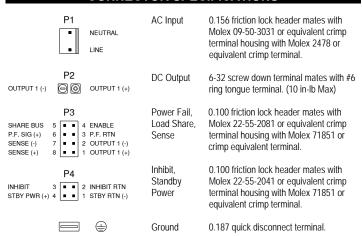
Compliant

Voltage Fluctuations/Flicker

NXT-225 SERIES MECHANICAL SPECIFICATIONS



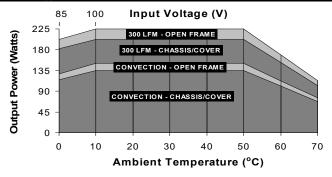
CONNECTOR SPECIFICATIONS



APPLICATIONS INFORMATION

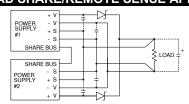
- 1. Continuous Output Power must not exceed 225W.
- Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
- Sufficient area must be provided around power supply 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), 20MHz handwidth
- 8. 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.
- 10. 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 lowimpedance 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.
- 12. 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 10ms prior to loss of output from AC failure.
- 15. 300LFM of airflow must be maintained one inch above the top of the heatsinks in any direction in open-frame forced-air applications; and one inch above and toward any of the three perforated sides of the cover in forced-air Chassis/Cover applications.
- 16. Low forward-voltage-drop oring diodes must be used in all load-sharing applications in 2.5 through 15V models. Oring diodes must be used on 24 through 48V models used in fault-tolerant applications but are optional in power-boosting applications. Oring diode power dissipation must be subtracted from the maximum output-power rating of each model.
- 17. Current-carrying conductors in load-sharing applications must be short and symmetrical.
- Refer to Load-Share Evaluation Board data sheet (page 58) for additional load-share applications information.
- 19. A load equal to 5% rated Output Power must be maintained when using Standby Power option. An external electrolytic capacitor across standby power output may be used to improve transient response.

MAX P_{OUT} vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements – Chart above applies to models 1003 thru 1008 only. 225W 300LFM forced air, open frame. 150W convection cooled open frame. Derate 10% with chassis and cover. Derate 1.5Wour/1Vin below 100Vin and between 100Vin and 85Vin. Use larger of the two deratings when using chassis/cover below 100Vin. Derate output power linearly to 50% between 50° and 70°C.

TYPICAL LOAD SHARE/REMOTE SENSE APPLICATION



SINGLE OUTPUT AC-DC

FEATURES:

- Compact 3.9" x 6.0" x 1.5" Size
- 3 Year Warranty
- Universal 85-264V Input
- Single High Efficiency Output
- Power Fail Warning
- 0-70°C Operating Temperature
- RoHS Compliant
- 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
- Optional Single Wire Load Sharing
- Optional Remote Inhibit/EnableOptional Chassis/Cover





CHASSIS/COVER

OPEN FRAME

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

MODEL LISTING				
	OPEN	FRAME	CHASS	IS/COVER
MODEL	300 LFM	CONVECTION COOLED	300 LFM	CONVECTION COOLED
NXT-325-1001	2.5V/65.0A	2.5V/40.0A	2.5V/58.5A	2.5V/36.0A
NXT-325-1002	3.3V/65.0A	3.3V/40.0A	3.3V/58.5A	3.3V/36.0A
NXT-325-1003	5V/65.0A	5V/40.0A	5V/58.5A	5V/36.0A
NXT-325-1004	12V/29.2A	12V/16.7A	12V/26.3A	12V/15.0A
NXT-325-1005	15V/23.3A	15V/13.3A	15V/20.9A	15V/12.0A
NXT-325-1006	24V/14.6A	24V/8.3A	24V/13.1A	24V/7.5A
NXT-325-1007	28V/12.5A	28V/7.1A	28V/11.3A	28V/6.4A
NXT-325-1008	48V/7.3A	48V/4.2A	48V/6.6A	48V/3.8A

Please refer to Output Power Derating chart.

ORDERING INFORMATION

Consult factory for alternate output configurations. Please specify the following optional features when ordering:

CH - Chassis LSEVB - Load Share Evaluation Board CO - Cover RE - Remote Inhibit

LS - Single Wire Load Sharing

All specifications are maximum at 25°C/325W unless otherwise stated, may vary by model and Are subject to change without notice.

NXT-325

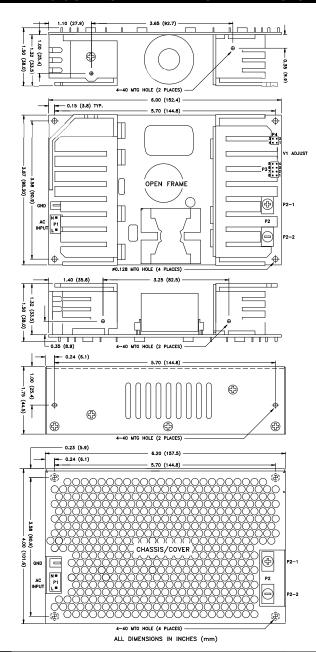
	VX I - 3	20
OUTF	UT SPECIFI	CATIONS
Output Power at 50°C ₍₁₎	100-202W	Convection Cooled, Open Frame
(See Derating Chart)	163-350W	300LFM Forced-Air Cooled ₍₁₅₎
Power Derating	2.0 Wout / 1 Vin I ± 0.5%	oelow 100 Vin (50% load)
Voltage Centering Voltage Adjust Range	± 0.5% 95-105%	(50% loau)
Load Regulation	0.5%	(0-100% load change)
Source Regulation	0.5%	(o room load onango)
Noise	1.0% or 100mV	Whichever is greater
Turn on Overshoot	None	
Transient Response		o within 1% of initial set point due to a 50
Overvoltage Protection	Latching betwee	, 500µS maximum, 4% maximum deviation n 110% and 150% of rated output voltage
Overpower Protection		Pout, cycle on/off, auto recovery
Hold Up Time		ower, 85-264V Input
Start Up Time	3 Seconds, 120V	
	JT SPECIFIC	CATIONS
Protection Class	05 2/41/-14-4/	
Source Voltage Frequency Range	85 – 264 Volts A0 47 – 63 Hz	
Input Protection ₍₆₎	Internal 8A Time	Delay fuse
Peak Inrush Current	50A (cold)	Boldy 1430
Efficiency	85% Typical, Full	Power varies by model
Power Factor	0.95 (Full Power,	230V), 0.98 (Full Power, 120V)
		ECIFICATIONS
Ambient Operating	0°C to + 70°C	Deline Chert
Temperature Range Thermal Shutdown	Derating: See Po	inhibited during excessive internal
Thermal Shuldown	temperatures, au	
Ambient Storage Temp. Range	- 40°C to + 85°C	iomatic rosoti
Operating Relative Humidity Range	20-90% non-cond	
Altitude		perating/ 40,000 ft. ASL Non-operating
Temperature Coefficient	0.02%/°C	
Vibration		10-2000Hz, 1 octave/min, 3 axis, 1 hour ea
Shock	20g, 11ms, 3 axis	
Means of Protection	NAL OF LOII	ICATIONS
Primary to Secondary	2MOPP (Means of	of Patient Protection
Primary to Ground		of Operator Protection)
Secondary to Ground	Operational Insula	ation(Consult factory for 1MOOP or 1MOP
Dielectric Strength _(8, 9) Reinforced Insulation	5656 VDC, Prima	ary to Secondary
Basic Insulation	2121 VDC, Prima	ry to Ground
Operational Insulation	707 VDC, Secon	ndary to Ground
Leakage Current		
Earth Leakage	<300µA NC, <10	
Touch Current Power Fail Signal ₍₁₄₎	<100µA NC, <50	out power failure 10 ms minimum prior to
Tower Fall Signal(14)	output 1 dropping	11%.
Remote Inhibit (optional)	Isolated. Contact	closure inhibits output.
Load Share (optional)(16, 17, 18)		nt sharing with return via negative sense
		current share load is 10% of each module
		ing. Maximum output voltage deviation s is 5% for 2.5 through 5 V models and 40
	mV for remaining	
Standby Power (optional)(19)		10%, 10 mA available only with Remote
, , , , , ,	Inhibit option.	- · · · · · · · · · · · · · · · · · · ·
Remote Sense ₍₁₀₎		ation of output cable losses
Mean-Time Between Failures		in., MIL-HDBK-217F, 25° C, GB
Weight FMC CRECIFIC ATIONS		Frame/ 2.15 Lbs. Chassis and Cover
Electrostatic Discharge	EN 61000-4-2	2:2014, 4 TH ed./IEC 61000-6-2:2005 ±8KV contact / ±15KV air discharge
Radiated Electromagnetic Field	EN 61000-4-2	80MHz-2.7GHz, 10V/m, 80% AM
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to line
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.
Voltage Dips	EN 61000-4-11	0% U _T , 0.5 cycles, 0-315° 100/240V A
		0% U _T , 1 cycles, 0° 100/240V A
		40% U _T , 10/12 cycles, 0° 100/240V B 70% U _T , 25/30 cycles, 0° 100/240V B
Voltage Interruptions	EN 61000-4-11	0% U _T , 300 cycles, 0° 100/240V B
Radiated Emissions	EN 55011/32	Class B
Conducted Emissions	EN 55011/32	Class B
Harmonic Current Emissions	EN 61000-3-2	Class A

EN 61000-3-3

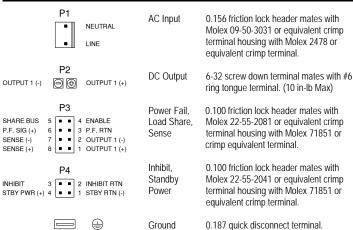
Compliant

Voltage Fluctuations/Flicker

NXT-325 SERIES MECHANICAL SPECIFICATIONS



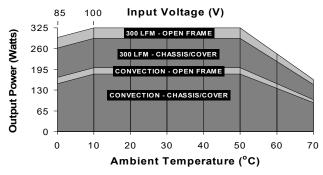
CONNECTOR SPECIFICATIONS



APPLICATIONS INFORMATION

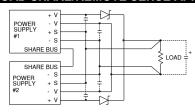
- 1. Continuous Output Power must not exceed 350W.
- Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
- Sufficient area must be provided around power supply 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), 20MHz bandwidth.
- 8. 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.
- 10. 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 lowimpedance 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.
- 12. 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 10ms prior to loss of output from AC failure.
- 15. 300LFM of airflow must be maintained one inch above the top of the heatsinks in any direction in open-frame forced-air applications; and one inch above and toward any of the three perforated sides of the cover in forced-air Chassis/Cover applications.
- 16. Low forward-voltage-drop oring diodes must be used in all load-sharing applications in 2.5 through 15V models. Oring diodes must be used on 24 through 48V models used in fault-tolerant applications but are optional in power-boosting applications. Oring diode power dissipation must be subtracted from the maximum output-power rating of each model.
- 17. Current-carrying conductors in load-sharing applications must be short and symmetrical.
- Refer to Load-Share Evaluation Board data sheet (page 58) for additional load-share applications information.
- 19. A load equal to 5% rated output power must be maintained when using Standby Power option. An external electrolytic capacitor across standby power output may be used to improve transient response.

MAX Pout vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements – Chart above applies to models 1003 thru 1008 only. 325W 300LFM forced air, open frame. 200W convection cooled open frame. Derate 10% with chassis and cover. Derate 1.5Wout/1Vin below 100Vin and between 100Vin and 85Vin. Use larger of the two deratings when using chassis/cover below 100Vin. Derate output power linearly to 50% between 50° and 70°C.

TYPICAL LOAD SHARE/REMOTE SENSE APPLICATION



- 3 Year Warranty
- Universal 85-264V Input
- Single High Efficiency Output
- Power Fail Warning
- 0-70°C Operating Temperature
- RoHS Compliant
- Compact 3.9" x 8.0" x 1.5" Size
 3 Year Warranty
 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
 - Optional Single Wire Load Sharing
 - Optional Remote Inhibit/Enable
 - Optional Chassis/Cover



CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c 911 us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 201 2
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2 nd Edition IEC 60601-1:2005/A1:2012
c 911 us	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 SUD Market Market	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
(E	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

OPEN FRAME		CHASSIS/COVER		
MODEL	300 LFM	CONVECTION COOLED	300 LFM	CONVECTION
NXT-400-1001	2.5V/80.0A	2.5V/45.0A	2.5V/72.0A	2.5V/40.5A
NXT-400-1002	3.3V/80.0A	3.3V/45.0A	3.3V/72.0A	3.3V/40.5A
NXT-400-1003	5V/80.0A	5V/45.0A	5V/72.0A	5V/40.5A
NXT-400-1004	12V/33.3A	12V/18.8A	12V/29.9A	12V/16.9A
NXT-400-1005	15V/26.7A	15V/15.0A	15V/24.0A	15V/13.5A
NXT-400-1006	24V/16.7A	24V/9.4A	24V/15.0A	24V/8.5A
NXT-400-1007	28V/14.3A	28V/8.0A	28V/12.8A	28V/7.2A
NXT-400-1008	48V/8.3A	48V/4.7A	48V/7.5A	48V/4.2A

Please refer to Output Power Derating chart.

ORDERING INFORMATION

Consult factory for alternate output configurations. Please specify the following optional features when ordering:

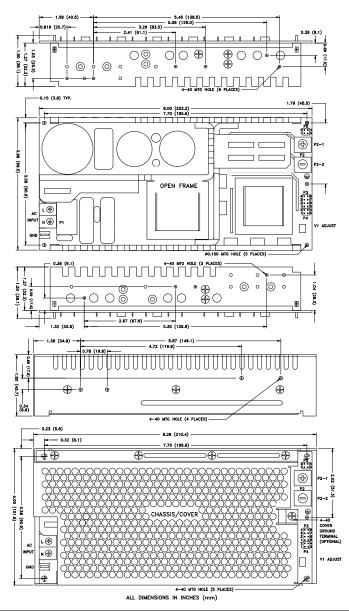
CH - Chassis LSEVB - Load Share Evaluation Board CO - Cover RE - Remote Inhibit

LS - Single Wire Load Sharing

All specifications are maximum at 25 $^{\circ}\text{C}/400\text{W}$ unless otherwise stated, may vary by model and are subject to change without notice.

225W Convection Cooled, Open Frame 400W 300LFM Forced-Air Cooled ₍₁₅₎ 2.5 Wour / 1 V _{IN} below 100 V _{IN} ± 0.5% (50% load) 95-105%
225W Convection Cooled, Open Frame 400W 300LFM Forced-Air Cooled(15) 2.5 Wout / 1 Vin below 100 Vin ± 0.5% (50% load)
2.5 Wout / 1 Vin below 100 Vin ± 0.5% (50% load)
± 0.5% (50% load)
= 0.070
0.5% (0-100% load change)
0.5% (0-100% load change)
1.0% or 100mV Whichever is greater
None
Output recovers to within 1% of initial set point due to a 50
step load change, 500µS maximum, 4% maximum deviatio
Latching, between 110% and 150% of rated output voltage
110-130% rated Pout, cycle on/off, auto recovery
16ms min., Full Power, 85-264V Input
3 Seconds, 120V Input
JT SPECIFICATIONS
05 04414 # 40
85 – 264 Volts AC
47 – 63 Hz Internal 10A Time Delay fuse
50A (cold)
85% Typical, Full Power varies by model
0.95 (Full Power, 230V), 0.98 (Full Power, 120V)
MENTAL SPECIFICATIONS
0°C to + 70°C
Derating: See Power Rating Chart
Output voltage is inhibited during excessive internal
temperatures, automatic reset.
- 40°C to + 85°C
10,000 ft. ASL Operating/ 40,000 ft. ASL Non-operating
0.02%/°C
2.5g, 10Hz. – 2KHz per MIL-STD-810F Method 514.5
20g, peak per MIL-STD-810F Method 516.5
RAL SPECIFICATIONS
2MOPP (Means of Patient Protection)
1MOOP (Means of Operator Protection)
Operational Insulation (Consult factory for 1MOOP or 1MOP
5656 VDC, Primary to Secondary
2121 VDC, Primary to Ground
707 VDC, Secondary to Ground
<300μA NC, <1000μA SFC
<100µA NC, <500µA SFC
<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to
<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%.
<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%. Isolated. Contact closure inhibits output.
<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%. Isolated. Contact closure inhibits output. Single wire current sharing with return via negative sense
<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%. Isolated. Contact closure inhibits output. Single wire current sharing with return via negative sense return. Minimum current share load is 10% of each moduli output current rating. Maximum output voltage deviation
<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%. Isolated. Contact closure inhibits output. Single wire current sharing with return via negative sense return. Minimum current share load is 10% of each module output current rating. Maximum output voltage deviation between modules is 5% for 2.5 through 5 V models and 40 minimum current share load is 10% of each module output current rating. Maximum output voltage deviation between modules is 5% for 2.5 through 5 V models and 40 minimum current share load is 100 minimum current
<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%. Isolated. Contact closure inhibits output. Single wire current sharing with return via negative sense return. Minimum current share load is 10% of each module output current rating. Maximum output voltage deviation between modules is 5% for 2.5 through 5 V models and 40 mV for remaining models.
<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%. Isolated. Contact closure inhibits output. Single wire current sharing with return via negative sense return. Minimum current share load is 10% of each module output current rating. Maximum output voltage deviation between modules is 5% for 2.5 through 5 V models and 4 mV for remaining models. Isolated 5 VDC ± 10%, 10mA available with Remote Inhib
<00\(\text{\pmatrix}\) A NC, <500\(\text{\pmatrix}\) A SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%. Isolated. Contact closure inhibits output. Single wire current sharing with return via negative sense return. Minimum current share load is 10% of each moduloutput current rating. Maximum output voltage deviation between modules is 5% for 2.5 through 5 V models and 4 mV for remaining models. Isolated 5 VDC \(\pmatrix\) 10%, 10mA available with Remote Inhib Option.
<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%. Isolated. Contact closure inhibits output. Single wire current sharing with return via negative sense return. Minimum current share load is 10% of each moduloutput current rating. Maximum output voltage deviation between modules is 5% for 2.5 through 5 V models and 4 mV for remaining models. Isolated 5 VDC ± 10%, 10mA available with Remote Inhib Option. 400mV compensation of output cable losses
<00\(\text{\tex{\tex
<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%. Isolated. Contact closure inhibits output. Single wire current sharing with return via negative sense return. Minimum current share load is 10% of each module output current rating. Maximum output voltage deviation between modules is 5% for 2.5 through 5 V models and 4 mV for remaining models. Isolated 5 VDC ± 10%, 10mA available with Remote Inhib Option. 400mV compensation of output cable losses 100,000 Hours min., MIL-HDBK-217F, 25° C, GB 2.65 Lbs. Open Frame/ 3.60 Lbs. Chassis and Cover
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<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%. Isolated. Contact closure inhibits output. Single wire current sharing with return via negative sense return. Minimum current sharing with return via negative sense return. Minimum current sharing with return via negative sense return. Minimum current share load is 10% of each module output current rating. Maximum output voltage deviation between modules is 5% for 2.5 through 5 V models and 40 mV for remaining models. Isolated 5 VDC ± 10%, 10mA available with Remote Inhib Option. 400mV compensation of output cable losses 100,000 Hours min., MIL-HDBK-217F, 25° C, GB 2.65 Lbs. Open Frame/ 3.60 Lbs. Chassis and Cover (IEC 60601-1-2:2014, 4 TH ed./IEC 61000-6-2:2005 EN 61000-4-2 ±8KV contact / ±15KV air discharge EN 61000-4-3 80MHz-2.7GHz, 10V/m, 80% AM EN 61000-4-4 ±2 KV, SHz/100KHz EN 61000-4-5 ±2 KV line to earth / ±1 KV line to line EN 61000-4-8 30A/m, 60 Hz. EN 61000-4-11 0% UT, 0.5 cycles, 0-315° 100/240V AR 0% UT, 1 cycles, 0° 100/240V AR
<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%. Isolated. Contact closure inhibits output. Single wire current sharing with return via negative sense return. Minimum current sharing output voltage deviation between modules is 5% for 2.5 through 5 V models and 40 mV for remaining models. Isolated 5 VDC ± 10%, 10mA available with Remote Inhib Option. 400mV compensation of output cable losses 100,000 Hours min., MIL-HDBK-217F, 25° C, GB 2.65 Lbs. Open Frame/ 3.60 Lbs. Chassis and Cover IEC 60601-1-2:2014, 4 TH ed./IEC 61000-6-2:2005 EN 61000-4-2 ±8KV contact / ±15KV air discharge EN 61000-4-3 80MHz-2.7GHz, 10V/m, 80% AM EN 61000-4-4 ±2 KV, 5KHz/100KHz EN 61000-4-5 ±2 KV line to earth / ±1 KV line to line EN 61000-4-6 0.15 to 80MHz, 10V, 80% AM EN 61000-4-7 EN 61000-4-8 30A/m, 60 Hz. EN 61000-4-1 UT, 10712 cycles, 0° 100/240V A 40% UT, 10/12 cycles, 0° 100/240V A 70% UT, 25/30 cycles, 0° 100/240V B
<100µA NC, <500µA SFC Logic low with input power failure 10 ms minimum prior to output 1 dropping 1%. Isolated. Contact closure inhibits output. Single wire current sharing with return via negative sense return. Minimum current share load is 10% of each module output current rating. Maximum output voltage deviation between modules is 5% for 2.5 through 5 V models and 4 mV for remaining models. Isolated 5 VDC ± 10%, 10mA available with Remote Inhib Option. 400mV compensation of output cable losses 100,000 Hours min., MIL-HDBK-217F, 25° C, GB 2.65 Lbs. Open Frame/ 3.60 Lbs. Chassis and Cover IEC 60601-1-2:2014, 4 TH ed./IEC 61000-6-2:2005 EN 61000-4-2 ±8KV contact / ±15KV air discharge EN 61000-4-3 80MHz-2.7GHz, 10V/m, 80% AM EN 61000-4-4 ±2 KV, 5KHz/100KHz EN 61000-4-5 ±2 KV line to earth / ±1 KV line to line EN 61000-4-8 30A/m, 60 Hz. EN 61000-4-1 0% UT, 0.5 cycles, 0° 100/240V A 40% UT, 10/12 cycles, 0° 100/240V B 70% UT, 25/30 cycles, 0° 100/240V B 70% UT, 25/30 cycles, 0° 100/240V B TOW UT, 25/30 cycles, 0° 100/240V B EN 61000-4-11 0% UT, 300 cycles, 0° 100/240V B TOW UT, 25/30 cycles, 0° 100/240V B TOW UT, 25/30 cycles, 0° 100/240V B TOW UT, 25/30 cycles, 0° 100/240V B
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NXT-400 SERIES MECHANICAL SPECIFICATIONS



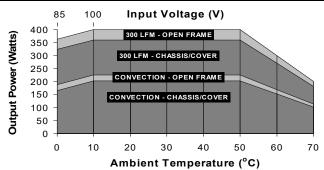
CONNECTOR SPECIFICATIONS

SOURCE FOR SI ESTIMATIONS			
	P1	AC Input	Terminal block with 6-32 screws on 0.325 centers mates with #6, spade terminals. (8 in-lb max)
OUTPUT 1 (-)	P2 OUTPUT 1 (+)	DC Output	10-32 screw down terminal mates with #10 ring tongue terminal. (10 in-lb Max)
SHARE BUS ENABLE OUTPUT 1 (+) SENSE (+)	P3 4 8 SENSE (-) 7 SENSE (-) 6 OUTPUT 1 (-) 5 SENSE (-)	Load Share, Sense	0.100 friction lock header mates with Molex 22-55-2081 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.
P.F. RTN P.F. SIG (+)	P4 2 • • 4 P.F. RTN 1 • • 3 P.F. SIG (+)	Power Fail	0.100 friction lock header mates with Molex 22-55-2041 or equivalent crimp terminal housing with Molex 71851 or crimp equivalent terminal.
INHIBIT RTN INHIBIT	P5 2	Inhibit, Standby Power	0.100 friction lock header mates with Molex 22-55-2041 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.
		Ground	0.187 quick disconnect terminal.

APPLICATIONS INFORMATION

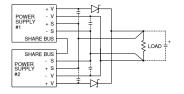
- 1. Continuous Output Power must not exceed 400W.
- Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
- Sufficient area must be provided around power supply 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), 20MHz bandwidth.
- 8. 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.
- 10. 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 lowimpedance 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.
- 12. 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 10ms prior to loss of output from AC failure.
- 15. 300LFM of airflow must be maintained one inch above the top of the heatsinks in any direction in open-frame forced-air applications; and one inch above and toward any of the three perforated sides of the cover in forced-air Chassis/Cover applications.
- 16. Low forward-voltage-drop oring diodes must be used in all load-sharing applications in 2.5 through 15V models. Oring diodes must be used on 24 through 48V models used in fault-tolerant applications but are optional in power-boosting applications. Oring diode power dissipation must be subtracted from the maximum output-power rating of each model.
- 17. Current-carrying conductors in load-sharing applications must be short and symmetrical.
- Refer to Load-Share Evaluation Board data sheet (page 58) for additional load-share applications information.
- 19. A load equal to 5% rated output power must be maintained when using Standby Power option. An external electrolytic capacitor across standby power output may be used to improve transient response.

MAX Pout vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements – Chart above applies to models 1003 thru 1008 only. 400W 300LFM forced air, open frame. 225W convection cooled open frame. Derate 10% with chassis and cover. Derate 2.5Wout/1V_{IN} below 100V_{IN} and between 100V_{IN} and 85V_{IN}. Use larger of the two deratings when using chassis/cover below 100V_{IN}. Derate output power linearly to 50% between 50° and 70°C.

TYPICAL LOAD SHARE/REMOTE SENSE APPLICATION



- Compact 2.5" x 4.5" x 1.2" Size
- 2 Year Warranty
- 18-36VDC Input
- One to Four Outputs
- 4242VDC Reinforced Insulation
- Under/Overvoltage Lockout
- 0-70°C Operating Temperature RoHS Compliant • Optional Chassis/Cover

• IEC 60601-1 3rd ed. Medical Cert.

• IEC 60950-1 2nd ed. ITE Certification

- Power Good Signal
- Size/Pin Compatible with REL-70 Series





CHASSIS/COVER

OPEN FRAME

	SAFETY SPE	CIFICATIONS
c FLL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c 711 us	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 SUD Parallel	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING				
OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4	
+3.3V/6A	+5V/5A	+12V/2A ₍₁₈₎	-12V/2A ₍₁₈₎	
+5V/6A	+3.3V/5A	+12V/2A(18)	-12V/2A ₍₁₈₎	
+5V/6A	+3.3V/5A	+15V/2A ₍₁₈₎	-15V/2A ₍₁₈₎	
+5V/6A	-5V/5A	+12V/2A(18)	-12V/2A ₍₁₈₎	
+5V/6A	-5V/5A	+15V/2A(18)	-15V/2A ₍₁₈₎	
+5V/6A	+24V/2A	+12V/2A(18)	-12V/2A ₍₁₈₎	
+5V/6A	+24V/2A	+15V/2A(18)	-15V/2A ₍₁₈₎	
+5V/6A	+12V/2A		-12V/2A	
+5V/6A	+15V/2A		-15V/2A	
+3.3V/6A	+5V/5A			
+5V/6A	+12V/4A			
+5V/6A	+24V/2A			
+12V/3A	-12V/3A			
+15V/3A	-15V/2A			
2.5V/14A ₍₁₇₎				
3.3V/14A ₍₁₇₎				
5V/14A ₍₁₇₎				
12V/5.8A				
15V/4.7A				
24V/2.9A				
28V/2.5A				
48V/1.5A				
	+3.3V/6A +5V/6A +5V/6A +5V/6A +5V/6A +5V/6A +5V/6A +5V/6A +5V/6A +5V/6A +12V/3A +15V/3A 2.5V/14A(17) 12V/5.8A 15V/4.7A 24V/2.9A 28V/2.5A	OUTPUT 1 OUTPUT 2 +3.3V/6A +5V/5A +5V/6A +3.3V/5A +5V/6A -5V/5A +5V/6A -5V/5A +5V/6A +24V/2A +5V/6A +24V/2A +5V/6A +12V/2A +5V/6A +15V/2A +5V/6A +15V/2A +3.3V/6A +5V/5A +5V/6A +12V/2A +3.3V/6A +5V/5A -5V/6A +12V/2A +3.3V/6A +5V/5A -5V/6A +12V/2A +5V/6A +12V/2A +5V/6A +12V/2A +5V/6A +12V/2A +5V/6A +12V/3A -15V/3A -15V/2A 2.5V/14A(17) 3.3V/14A(17) 5V/14A(17) 12V/5.8A 15V/4.7A 24V/2.9A 28V/2.5A	OUTPUT 1 OUTPUT 2 OUTPUT 3 +3.3V/6A +5V/5A +12V/2A(18) +5V/6A +3.3V/5A +15V/2A(18) +5V/6A -5V/5A +15V/2A(18) +5V/6A -5V/5A +15V/2A(18) +5V/6A +24V/2A +12V/2A(18) +5V/6A +24V/2A +12V/2A(18) +5V/6A +12V/2A +5V/6A +12V/2A +5V/6A +112V/2A +5V/6A +15V/2A +5V/6A +15V/2A +3.3V/6A +5V/5A +5V/6A +24V/2A +15V/6A +12V/4A +5V/6A +24V/2A +15V/6A +12V/4A +5V/6A +24V/2A +15V/3A -12V/3A +15V/3A -15V/2A 2.5V/14A(17) 3.3V/14A(17) 5V/14A(17) 12V/5.8A 15V/4.7A 24V/2.9A 28V/2.5A	

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

BD - Reverse Input Protection

- Isolated Outputs TS - Terminal Strip

SINGLE/MULTI OUTPUT DC-DC

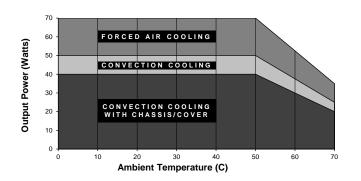
OUT	PUT SPECIF	ICATIO	NS
Total Output Power at 50°C(1)	50W		on Cooled _(16, 18)
(See Derating Chart)	70W	300LFM I	Forced-Air Cooled(15, 17, 19)
Output Voltage Centering	Output 1:	± 0.5%	(All outputs
	Output 2:	$\pm 5.0\%$	at 50% load)
	Output 3:	$\pm 5.0\%$	
	Output 4:	± 5.0%	
Output Voltage Adjust Range	Output 1:	95 - 1059	6
Load Regulation	Output 1:	0.5%	(10-100%
-	Output 2:	5.0%	load change)
	(4001-5 Models)	8.0%	_
	(2001 Model)	8.0%	
	Output 3:	5.0%	
	Output 4:	5.0%	
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		
Voltage Deviation	5.0%		
Recovery Time	500μS		
Load Change	50% to 100%		
Output Overvoltage Protection	Output 1:	110% to 1	50%
Output Overpower Protection	110-160% rated l	Pout, cycle	on/off, auto recovery
Start Up Time	4 Seconds		`
INF	PUT SPECIFIC	CATION	IS
Innut Voltage Pange	18-36 VDC		•

IN	PUT SPECIFICATIONS
Input Voltage Range	18-36 VDC
Input Under-Voltage Lockout	
Turn-On Voltage	14.5-17.5 VDC
Turn-Off Voltage	14.0-17.0 VDC
Input Overvoltage Shutdown	37.0-43.0 VDC
Maximum Input Current	5.5 A
Reflected Ripple Current	5 %
Efficiency	78% Typ., Full Power, 24VDC, varies by model

Efficiency	76% Typ., Full Power, 24VDC, Valles by filoder			
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			

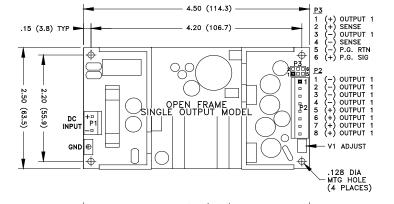
GENERAL SPECIFICATIONS Means of Protection 2MOOP (Means of Operator Protection) Primary to Secondary 1MOOP (Means of Operator Protection) Primary to Ground Operational Insulation(Consult factory for 1MOOP or 1MOPP) Secondary to Ground Dielectric Strength_(7,8) Reinforced Insulation 4242 VDC, Primary to Secondary Basic Insulation 2121 VDC, Primary to Ground Operational Insulation 707 VDC, Secondary to Ground Power Good Signal₍₁₁₎ Logic high with input voltage above Vin min. 250mV compensation of output cable losses Remote Sense (singles only)(9) 100,000 Hours min., MIL-HDBK-217F, 25° C, GB Mean-Time Between Failures 0.60 Lbs. Open Frame 1.00 Lbs. Chassis and Cover

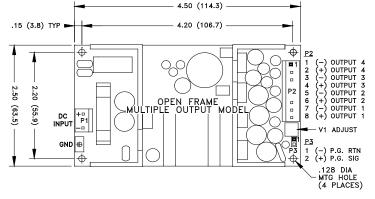
POWER vs. AMBIENT TEMPERATURE

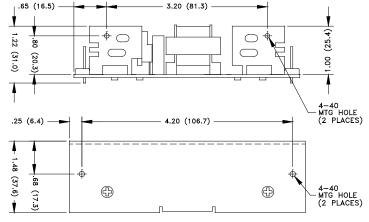


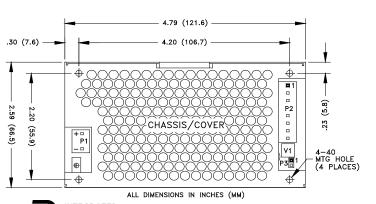
All specifications are maximum at 25°C/70W unless otherwise stated, may vary by model and are subject to change without notice.

DC2-70 SERIES MECHANICAL SPECIFICATIONS 1.22 (20.5) 65 (16.5) 3.20 (81.3)









APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 70W 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.
- 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 (single output models only). 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.
- Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
- 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
- 13. Total Power must not exceed 50W with convection cooling on open-frame models except
- 14. Total Power must not exceed 70W with 300LFM forced-air cooling on open-frame models.
- 15. Total Power must not exceed 40W with convection cooling and Chassis/Cover option.
- Total Power must not exceed 70W with 300LFM forced-air cooling and Chassis/Cover option.
- 17. Rated 10A maximum with convection cooling.
- 18. Rated 1.5A maximum with convection cooling

		CONNECTOR ORECIFICATIONS
		CONNECTOR SPECIFICATIONS
P1	DC Input	0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.
P2	DC Output (Single)	0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or
		equivalent crimp terminal.
P2	DC Output	0.156 friction lock header mates with Tyco 770849-8 or
	(Multiple)	equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	P.G./Sense (Single)	0.100 breakaway header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
P3	Power Good (Multiple)	0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or

equivalent crimp terminal

SINGLE/MULTI OUTPUT DC-DC

FEATURES:

- Compact 3" x 5" x 1.3" Size
- 2 Year Warranty
- 18-36VDC Input
- One to Four Outputs
- 4242VDC Reinforced Insulation
- Under/Overvoltage Lockout
- IEC 60601-1 3rd ed. Medical Cert.
- IEC 60950-1 2nd ed. ITE Certification
- 0-70°C Operating Temperature
- RoHS Compliant
- Optional Chassis/Cover
- Power Good Signal
- Size/Pin Compatible with REL-110 Series





CHASSIS/COVER

OPEN FRAME

	SAFETY SPE	CIFICATIONS
c Al us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c Al us	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 SUD	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1 ₍₂₀	OUTPUT	2 ₍₂₀₎ OUTPUT	3 ₍₁₉₎ OUTPUT 4 ₍₁₉₎
DC2-110-4001	+3.3V/10A ₍₁₇₎	+5V/6A	+12V/2A	-12V/2A
DC2-110-4002	+5V/10A ₍₁₇₎	+3.3V/6A	+12V/2A	-12V/2A
DC2-110-4003	+5V/10A ₍₁₇₎	+3.3V/6A	+15V/2A	-15V/2A
DC2-110-4004	+5V/10A ₍₁₇₎	-5V/6A	+12V/2A	-12V/2A
DC2-110-4005	+5V/10A ₍₁₇₎	-5V/6A	+15V/2A	-15V/2A
DC2-110-4006	+5V/10A ₍₁₇₎	+24V/2A	+12V/2A	-12V/2A
DC2-110-4007	+5V/10A ₍₁₇₎	+24V/2A	+15V/2A	-15V/2A
DC2-110-3001	+5V/10A ₍₁₇₎	+12V/3A		-12V/3A
DC2-110-3002	+5V/10A ₍₁₇₎	+15V/2A		-15V/2A
DC2-110-2001	+3.3V/10A ₍₁₇₎	+5V/6A		
DC2-110-2002	+5V/10A ₍₁₇₎	+12V/5A		
DC2-110-2003	+5V/10A ₍₁₇₎	+24V/3A		
DC2-110-2004	+12V/5A	-12V/4A		
DC2-110-2005	+15V/4A	-15V/3A		
DC2-110-1001	2.5V/22A ₍₁₈₎			
DC2-110-1002	3.3V/22A ₍₁₈₎			
DC2-110-1003	5V/22A ₍₁₈₎			
DC2-110-1004	12V/9.2A			
DC2-110-1005	15V/7.3A			
DC2-110-1006	24V/4.6A			
DC2-110-1007	28V/3.9A			
DC2-110-1008	48V/2.3A			

ORDERING INFORMATION

Consult factory for alternate output configurations.

Consult factory for positive, negative or floating outputs.

Please specify the following optional features when ordering:

 $\begin{array}{lll} \text{CH - Chassis} & \text{I/O - Isolated Outputs} \\ \text{CO - Cover} & \text{TS - Terminal Strip} \end{array}$

BD - Reverse Input Protection

DC2-110

OUTPUT

Total Output Power at 50°C ₍₁₎	80W	Convection	n Cooled _(13, 15)
(See Derating Chart)	110W	2001 EM E	orced-Air Cooled _(12, 14, 16)
Output Voltage Centering	Output 1:		(All outputs
Output voltage Centening		± 0.5%	at 50% load)
	Output 2:	± 5.0%	at 50% loau)
	Output 3:	± 5.0%	
	Output 4:	± 5.0%	
Output Voltage Adjust Range	Output 1:	95 - 105%	40.4000
Load Regulation	Output 1:	0.5%	(10-100%
	Output 2:	5.0%	load change)
	(4001-5 Models)	8.0% 6.0%	
	(2001 Model) Output 3:	5.0%	
	Output 4:	5.0%	
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	1.070	
Transient Response	Outputs 1 – 4		
Voltage Deviation	5.0%		
Recovery Time	500μS		
Load Change	50% to 100%		
Output Overvoltage Protection	Output 1:	110% to 15	0%
Output Overpower Protection			on/off, auto recovery
Start Up Time	5 Seconds	, .,	
	UT SPECIFIC	CATIONS	S
Input Voltage Range	18-36 VDC		
Input Under-Voltage Lockout	.000.20		
Turn-On Voltage	14.5-17.5 VDC		
Turn-Off Voltage	14.0-17.0 VDC		
Input Overvoltage Shutdown	37.0-43.0 VDC		
Maximum Input Current	8.5 A		
Reflected Ripple Current	5 %		
Efficiency	82% Typ., Full Po	ower, 24VD0	C, varies by model
	IMENTAL SP		
Ambient Operating	0°C to + 70°C		
Temperature Range	Derating: See Po	wer Rating (Chart
Ambient Storage Temp. Range	- 40°C to + 85°C		
Temperature Coefficient	Outputs 1 – 4:	0.02%	I°C.
	ERAL SPECIF		
Means of Protection		IOATIO	NO
Primary to Secondary	2MOOP (Means	of Operator	Protection)
Primary to Ground	1MOOP (Means		
Secondary to Ground			It factory for 1MOOP or 1MOPP)
Dielectric Strength _(7, 8)	*	1	
Reinforced Insulation	4242 VDC, Prima	ary to Secon	dary
Basic Insulation	2121 VDC, Prima	ary to Groun	d
Operational Insulation	707 VDC, Secon	ndary to Gro	ound
Power Good Signal ₍₁₁₎	Logic high with in	put voltage	above Vin min.
Daniela Canas (almalas anhi)	2F0ma\/ aama:	otion of a	. A colubertaria

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

0.65 Lbs. 1.15 Lbs.

Remote Sense (singles only)(9)

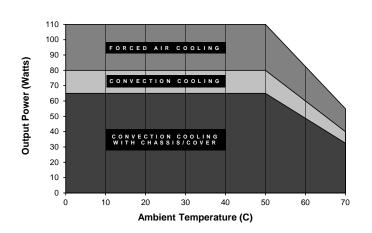
Mean-Time Between Failures

250mV compensation of output cable losses

Chassis and Cover

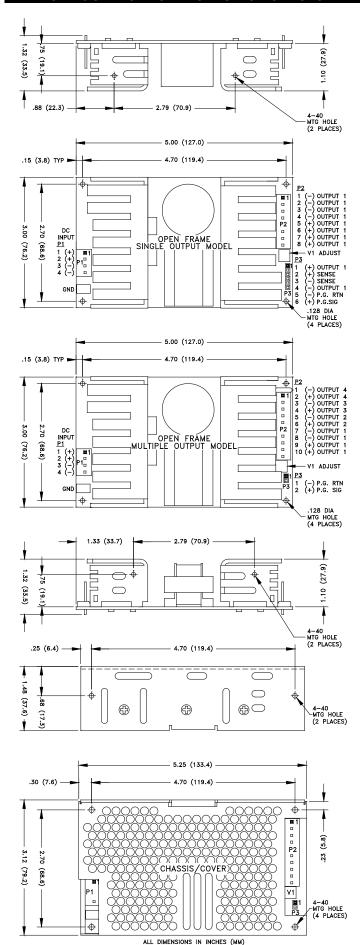
Open Frame

100,000 Hours min., MIL-HDBK-217F, 25° C, GB



All specifications are maximum at 25° C/110W unless otherwise stated, may vary by model and are subject to change without notice.

DC2-110 SERIES MECHANICAL SPECIFICATIONS



APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 110W
 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.
- 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.
- 7. 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 (single output models only). 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.
- Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
- 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 80W with convection cooling on open-frame models except where noted.
- Total Power must not exceed 110W with 300LFM forced-air cooling on open-frame models.
- 15. Total Power must not exceed 65W with convection cooling and Chassis/Cover option.
- Total Power must not exceed 110W with 300LFM forced-air cooling and Chassis/Cover option.
- 17. Rated 8A maximum with convection cooling.
- 18. Rated 16A maximum with convection cooling.
- 19. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
- 20. Total current from Outputs 1 & 2 must not exceed 12A with convection cooling.

		CONNECTOR SPECIFICATIONS
P1	DC Input	0.156 friction lock header mates with Tyco 640250-4 or equivalent crimp terminal housing with Tyco 3-640706-1 or
P2	DC Output	equivalent crimp terminal. 0.156 friction lock header mates with Tyco 770849-8 or
	(Single)	equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.
P2	DC Output (Multiple)	0.156 friction lock header mates with Tyco 1-770849-0 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	P.G./Sense (Single)	0.100 breakaway header mates with Molex 50-57-9006 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
P3	P.G. (Multiple)	0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.

SINGLE/MULTI OUTPUT DC-DC

FEATURES:

- Compact 3.8" x 6" x 1.3" Size
- 2 Year Warranty
- 18-36VDC Input
- One to Four Outputs
- 4242VDC Reinforced Insulation
- Under/Overvoltage Lockout
- IEC 60601-1 3rd ed. Medical Cert.
- IEC 60950-1 2nd ed. ITE Certification
- 0-70°C Operating Temperature
- RoHS Compliant
- Optional Chassis/Cover
- Power Good Signal
- Size/Pin Compatible with REL-150 Series



CHASSIS/COV	/ED

OPEN FRAME

	SAFETY SPEC	CIFICATIONS
c FL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2 nd Edition IEC 60601-1:2005/A1:2012
c 911 us	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	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
(€	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1 ₍₂₀	OUTPUT 2	₂₀₎ OUTPUT 3	3 ₍₁₉₎ OUTPUT 4 ₍₁₉₎
DC2-150-4001	+3.3V/15A ₍₁₇₎	+5V/8A	+12V/2A	-12V/2A
DC2-150-4002	+5V/15A ₍₁₇₎	+3.3V/8A	+12V/2A	-12V/2A
DC2-150-4003	+5V/15A ₍₁₇₎	+3.3V/8A	+15V/2A	-15V/2A
DC2-150-4004	+5V/15A ₍₁₇₎	-5V/8A	+12V/2A	-12V/2A
DC2-150-4005	+5V/15A ₍₁₇₎	-5V/8A	+15V/2A	-15V/2A
DC2-150-4006	+5V/15A ₍₁₇₎	+24V/3A	+12V/2A	-12V/2A
DC2-150-4007	+5V/15A ₍₁₇₎	+24V/3A	+15V/2A	-15V/2A
DC2-150-3001	+5V/15A ₍₁₇₎	+12V/4A		-12V/3A
DC2-150-3002	+5V/15A ₍₁₇₎	+15V/3A		-15V/2A
DC2-150-2001	+3.3V/15A ₍₁₇₎	+5V/8A		
DC2-150-2002	+5V/15A ₍₁₇₎	+12V/5A		
DC2-150-2003	+5V/15A ₍₁₇₎	+24V/3A		
DC2-150-2004	+12V/7.5A	-12V/5A		
DC2-150-2005	+15V/5A	-15V/5A		
DC2-150-1001	2.5V/30A ₍₁₈₎			
DC2-150-1002	3.3V/30A ₍₁₈₎			
DC2-150-1003	5V/30A ₍₁₈₎			
DC2-150-1004	12V/12.5A			
DC2-150-1005	15V/10.0A			
DC2-150-1006	24V/6.3A			
DC2-150-1007	28V/5.4A			
DC2-150-1008	48V/3.1A			

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 I/O - Isolated Outputs
CO - Cover TS - Terminal Strip

BD - Reverse Input Protection

DC2-150

OUT	PUT SPECIFI	<u>ICATIOI</u>	NS
Total Output Power at 50°C ₍₁₎	100W	Convection Cooled _(13, 15)	
(See Derating Chart)	150W	300LFM Forced-Air Cooled(12, 14, 16)	
Output Voltage Centering	Output 1:	± 0.5%	(All outputs at 50% load)
	Output 2:	$\pm 5.0\%$	
	Output 3:	$\pm 5.0\%$	
	Output 4:	$\pm 5.0\%$	
Output Voltage Adjust Range	Output 1:	95 - 105%)
Load Regulation	Output 1:	0.5%	(10-100% load change)
	Output 2:	5.0%	(10-100% load change)
	(4001-5 Models)	8.0%	(20-100% load change)
	(2001 Model)	6.0%	(20-100% load change)
	Output 3:	5.0%	(10-100% load change)
	Output 4:	5.0%	(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	Outputs 1 – 4		
Voltage Deviation	5.0%		
Recovery Time	500µS		
Load Change	50% to 100%		
Output Overvoltage Protection	Output 1:	110% to 15	50%
Output Overpower Protection	110-160% rated I	Pout, cycle	on/off, auto recovery
Start Up Time	5 Seconds		
INP	UT SPECIFIC	CATION	S
Input Voltage Range	18-36 VDC	•	
Input Under-Voltage Lockout			
Turn-0n Voltage	14.5-17.5 VDC		

Efficiency	82% Typ., Full Power, 24 VDC, varies by model
ENVIRONMEN	TAL 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

14.0-17.0 VDC

37.0-43.0 VDC 11.5 A

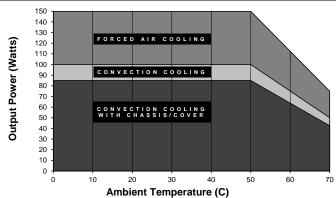
5 %

Turn-off Voltage
Input Overvoltage Shutdown

Maximum Input Current
Reflected Ripple Current

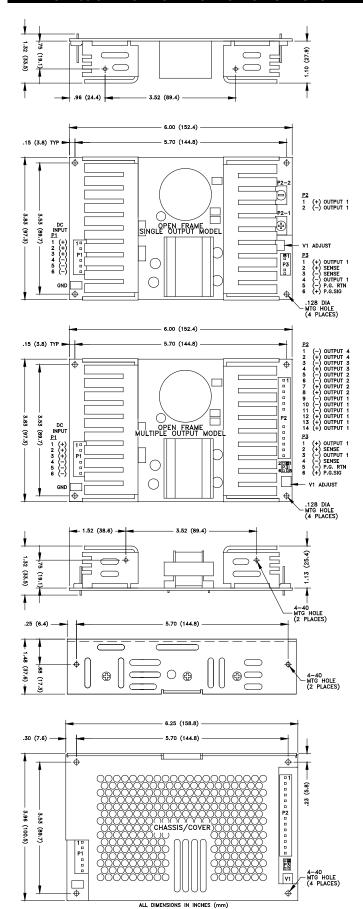
GENERAL SPECIFICATIONS Means of Protection 2MOOP (Means of Operator Protection) Primary to Secondary 1MOOP (Means of Operator Protection) Primary to Ground Operational Insulation(Consult factory for 1MOOP or 1MOPP) Secondary to Ground Dielectric Strength_(7,8) 4242 VDC, Primary to Secondary Reinforced Insulation Basic Insulation 2121 VDC, Primary to Ground Operational Insulation 707 VDC, Secondary to Ground Power Good Signal₍₁₁₎ Logic high with input voltage above Vin min. Remote Sense(9) 250mV compensation of output cable losses Mean-Time Between Failures 100,000 Hours min., MIL-HDBK-217F, 25° C, GB 0.90 Lbs. Open Frame

1.60 Lbs. Chassis and Cover MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



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

DC2-150 SERIES MECHANICAL SPECIFICATIONS



APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 150W
 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.
- 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.
- 7. 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.
- Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
- 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 100W with convection cooling on open-frame models except where noted.
- Total Power must not exceed 150W with 300LFM forced-air cooling on open-frame models.
- 15. Total Power must not exceed 85W with convection cooling and Chassis/Cover option.
- Total Power must not exceed 150W with 300LFM forced-air cooling and Chassis/Cover option.
- 17. Rated 12A maximum with convection cooling.
- 18. Rated 20A maximum with convection cooling.
- 19. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
- 20. Total current from Outputs 1 & 2 must not exceed 15A with convection cooling

		CONNECTOR SPECIFICATIONS
P1	DC Input	0.156 friction lock header mates with Molex 09-50-3061 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 09-50-3141 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	P.G./Sense (Single)	0.100 breakaway header mates with Molex 50-57-9006 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
P3	P.G./Sense (Multiple)	0.100 breakaway header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex type 70058 or equivalent crimp terminal.

- Compact 4.2" x 7.0" x 1.5" Size IEC 60601-1 3rd ed. Medical Cert.
- 2 Year Warranty
- 18-36VDC Input
- One to Four Outputs
- 4242VDC Reinforced Insulation Optional Chassis/Cover
- Under/Overvoltage Lockout
- IEC 60950-1 2nd ed. ITE Certification
- 0-70°C Operating Temperature
- RoHS Compatible
- Power Good Signal
- Size/Pin Compatible with REL-185 Series



CHA	SS	IS/C	OV	ER	

OPEN CHASSIS

	SAFETY SPE	CIFICATIONS
c FL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c FLL us	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 SUD	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1 ₍₂₎	O) OUTPUT 2	(20) OUTPUT 3	3 ₍₁₉₎ OUTPUT 4 ₍₁₉₎
DC2-185-4001	+3.3V/20A(17)	+5V/10A	+12V/2A	-12V/2A
DC2-185-4002	+5V/20A ₍₁₇₎	+3.3V/10A	+12V/2A	-12V/2A
DC2-185-4003	+5V/20A(17)	+3.3V/10A	+15V/2A	-15V/2A
DC2-185-4004	+5V/20A ₍₁₇₎	-5V/10A	+12V/2A	-12V/2A
DC2-185-4005	+5V/20A(17)	-5V/10A	+15V/2A	-15V/2A
DC2-185-4006	+5V/20A ₍₁₇₎	+24V/3A	+12V/2A	-12V/2A
DC2-185-4007	+5V/20A(17)	+24V/3A	+15V/2A	-15V/2A
DC2-185-3001	+5V/20A ₍₁₇₎	+12V/5A		-12V/3A
DC2-185-3002	+5V/20A(17)	+15V/4A		-15V/3A
DC2-185-2001	+3.3V/20A(17)	+5V/10A		
DC2-185-2002	+5V/20A(17)	+12V/8A		
DC2-185-2003	+5V/20A(17)	+24V/4A		
DC2-185-2004	+12V/10A	-12V/6A		
DC2-185-2005	+15V/8A	-15V/5A		
DC2-185-1001	2.5V/37A ₍₁₈₎			
DC2-185-1002	3.3V/37A ₍₁₈₎			
DC2-185-1003	5V/37A ₍₁₈₎			
DC2-185-1004	12V/15.4A			
DC2-185-1005	15V/12.3A			
DC2-185-1006	24V/7.7A			
DC2-185-1007	28V/6.6A			
DC2-185-1008	48V/3.8A			

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 I/O - Isolated Outputs CO - Cover TS - Terminal Strip

BD - Reverse Input Protection

Total Output Power at 50°C(1)

Convection Cooled_(13,15)

(See Derating Chart)	185W	300LFM	Forced-Air Cooled _(12, 14, 16)
Output Voltage Centering	Output 1:	± 0.5%	(All outputs
	Output 2:	$\pm 5.0\%$	at 50% load)
	Output 3:	$\pm 5.0\%$	
	Output 4:	$\pm 5.0\%$	
Output Voltage Adjust Range	Output 1:	95 - 1059	%
Load Regulation	Output 1:	0.5%	(10-100% load change)
	Output 2:	5.0%	(20-100% load change)
	(4001,4,5,2001)	10.0%	(20-100% load change)
	(4002,3)	15.0%	
	Output 3:	5.0%	
	Output 4:	5.0%	
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%	4400/1	1500/
Output Overvoltage Protection	Output 1:	110% to 1	
Output Overpower Protection		Pout, cycle	e on/off, auto recovery
Start Up Time	5 Seconds	3 A TION	10
	PUT SPECIFIC	JATION	NS S
Input Voltage Range	18-36 VDC		
Input Under-Voltage Lockout			
Turn-On Voltage	14.5-17.5 VDC		
Turn-Off Voltage	14.0-17.0 VDC		
Input Overvoltage Shutdown	37.0-43.0 VDC		
Maximum Input Current	14.0 A		
Reflected Ripple Current	5 %	0.0.0	
Efficiency	77% Typ., Full P	ower, 24VI	DC, varies by model
	IMENTAL SP	ECIFIC	ATIONS
Ambient Operating	0° C to + 70° C		
Temperature Range	Derating: See Po		g Chart
Ambient Storage Temp. Range	- 40° C to + 85°		
Temperature Coefficient	Outputs 1 – 4:		%/°C
GENI	ERAL SPECI	FICATION	ONS
Means of Protection			
Primary to Secondary	2MOOP (Means		
Primary to Ground	1MOOP (Means		
Secondary to Ground	Operational Insul	ation(Cons	sult factory for 1MOOP or 1MOPP)
Dielectric Strength _(7, 8)			
Reinforced Insulation	4242 VDC, Prima		
Dacia Inculation	2121 VDC Drime	aruta Cra	ind

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

1.28 Lbs. 2 16 l bs

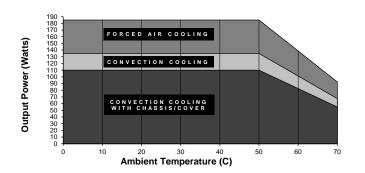
2121 VDC, Primary to Ground

707 VDC, Secondary to Ground Logic high with input voltage above Vin min.

250mV compensation of output cable losses

Chassis and Cover

100,000 Hours min., MIL-HDBK-217F, 25° C, GB Open Frame



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

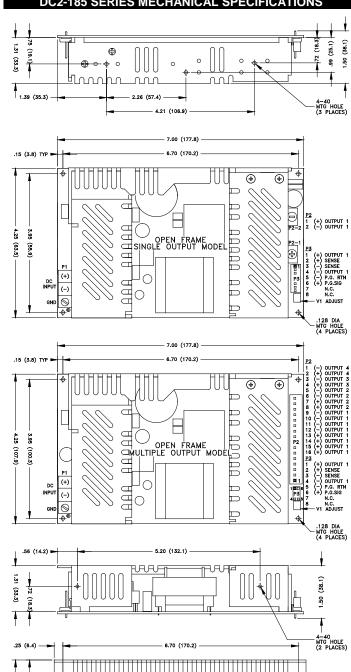
Basic Insulation

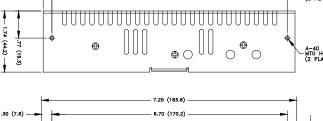
Power Good Signal₍₁₁₎

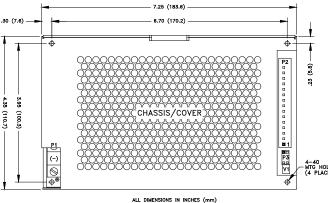
Operational Insulation

Remote Sense (singles only)(9) Mean-Time Between Failures

DC2-185 SERIES MECHANICAL SPECIFICATIONS







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.
- 3. 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 4. technology, industrial, and medical equipment and is not intended for stand-alone
- A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining 5. outputs
- 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.
- Power Good feature provides a logic-high signal from an open collector transistor when 11. DC input reaches minimum operating voltage.
- 12. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
- 13 Total Power must not exceed 135W with convection cooling on open-frame models except
- 14. Total Power must not exceed 185W with 300LFM forced-air cooling on open-frame models
- 15 Total Power must not exceed 110W with convection cooling and Chassis/Cover option.
- 16. Total Power must not exceed 185W with 300LFM forced-air cooling and Chassis/Cover option
- 17 Rated 15A maximum with convection cooling.
- 18. Rated 27A maximum with convection cooling.
- 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. 20.

CONNECTOR SPECIFICATIONS #6 standard (3)position terminal block DC Input P2 DC Output 6-32 screw down terminal mates with #6 ring tongue (Single) terminal. (10 in-lb max) P2 DC Output 0.156 friction lock header mates with Molex 09-50-3161 or (Multiple) equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal Ground 0.187 quick disconnect terminal. G P3 P.G./Sense 0.100 breakaway header mates with Molex 50-57-9008 or (Single) equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal 0.100 breakaway header mates with Molex 22-55-2081 or P3 P.G./Sense (Multiple) equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.

SINGLE/MULTI OUTPUT DC-DC

FEATURES:

- Compact 2.5" x 4.5" x 1.2" Size
- 2 Year Warranty
- 36-72VDC Input
- One to Four Outputs
- 4242VDC Reinforced Insulation
- Under/Overvoltage Lockout
- 0-70°C Operating TemperatureRoHS Compliant

• IEC 60601-1 3rd ed. Medical Cert.

• IEC 60950-1 2nd ed. ITE Certification

- Optional Chassis/CoverPower Good Signal
- Size/Pin Compatible with REL-70 Series





CHASSIS/COVER

OPEN FRAME

	SAFETY SPE	CIFICATIONS
c FLL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c FL us	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 SUD	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL	LISTING

MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
DC4-70-4001	+3.3V/6A	+5V/5A	+12V/2A ₍₁₈₎	-12V/2A ₍₁₈₎
DC4-70-4002	+5V/6A	+3.3V/5A	+12V/2A(18)	-12V/2A ₍₁₈₎
DC4-70-4003	+5V/6A	+3.3V/5A	+15V/2A ₍₁₈₎	-15V/2A ₍₁₈₎
DC4-70-4004	+5V/6A	-5V/5A	+12V/2A(18)	-12V/2A ₍₁₈₎
DC4-70-4005	+5V/6A	-5V/5A	+15V/2A ₍₁₈₎	-15V/2A ₍₁₈₎
DC4-70-4006	+5V/6A	+24V/2A	+12V/2A(18)	-12V/2A ₍₁₈₎
DC4-70-4007	+5V/6A	+24V/2A	+15V/2A(18)	-15V/2A ₍₁₈₎
DC4-70-3001	+5V/6A	+12V/2A		-12V/2A
DC4-70-3002	+5V/6A	+15V/2A		-15V/2A
DC4-70-2001	+3.3V/6A	+5V/5A		
DC4-70-2002	+5V/6A	+12V/4A		
DC4-70-2003	+5V/6A	+24V/2A		
DC4-70-2004	+12V/3A	-12V/3A		
DC4-70-2005	+15V/3A	-15V/2A		
DC4-70-1001	2.5V/14A ₍₁₇₎			
DC4-70-1002	3.3V/14A ₍₁₇₎			
DC4-70-1003	5V/14A ₍₁₇₎			
DC4-70-1004	12V/5.8A			
DC4-70-1005	15V/4.7A			
DC4-70-1006	24V/2.9A			
DC4-70-1007	28V/2.5A			
DC4-70-1008	48V/1.5A			

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 I/O – Isolated Outputs
CO – Cover TS – Terminal Strip

BD - Reverse Input Protection

DC4-70

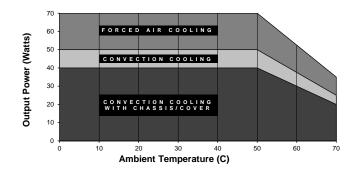
Total Output Power at 50°C ₍₁₎	50W	Convection Cooled _(13, 15)	
(See Derating Chart)	70W	300LFM Forced-Air Cooled(12, 14, 16)	
Output Voltage Centering	Output 1:	± 0.5%	(All outputs
	Output 2:	$\pm 5.0\%$	at 50% load)
	Output 3:	$\pm 5.0\%$	
	Output 4:	$\pm 5.0\%$	
Output Voltage Adjust Range	Output 1:	95 - 105%	
Load Regulation	Output 1:	0.5%	(10-100%
	Output 2:	5.0%	load change)
	(4001-5 Models)	8.0%	
	(2001 Model)	8.0%	
	Output 3:	5.0%	
	Output 4:	5.0%	
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		
Voltage Deviation	5.0%		
Recovery Time	500μS		
Load Change	50% to 100%		
Output Overvoltage Protection	Output 1:	110% to 15	0%
Output Overpower Protection	110-160% rated I	Pout, cycle	on/off, auto recovery
Start Up Time	4 Seconds		
INPL	JT SPECIFIC	CATION	S
Input Voltage Range	36-72 VDC		
Input Under-Voltage Lockout			_
Turn-On Voltage	29.0-35.0 VDC		
Turn-Off Voltage	28.0-34.0 VDC		
Input Overvoltage Shutdown	77.0-85.0 VDC		
Maximum Input Current	2.7 A		

Efficiency	78% Typ., Full Power, 48VDC, varies by model
ENVIRON	MENTAL 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
GENE	RAL SPECIFICATIONS
Means of Protection	

5 %

GEN	ERAL SPECIFICATIONS		
Means of Protection			
Primary to Secondary	2MOOP (Means of Operator Protection)		
Primary to Ground	1MOOP (Means of Operator Protection)		
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)		
Dielectric Strength _(7, 8)			
Reinforced Insulation	4242 VDC, Primary to Secondary		
Basic Insulation	2121 VDC, Primary to Ground		
Operational Insulation	707 VDC, Secondary to Ground		
Power Good Signal ₍₁₁₎	Logic high with input voltage above Vin min.		
Remote Sense (singles only)(9)	250mV compensation of output cable losses		
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB		
Weight	0.60 Lbs. Open Frame		
	1.00 Lbs. Chassis and Cover		

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

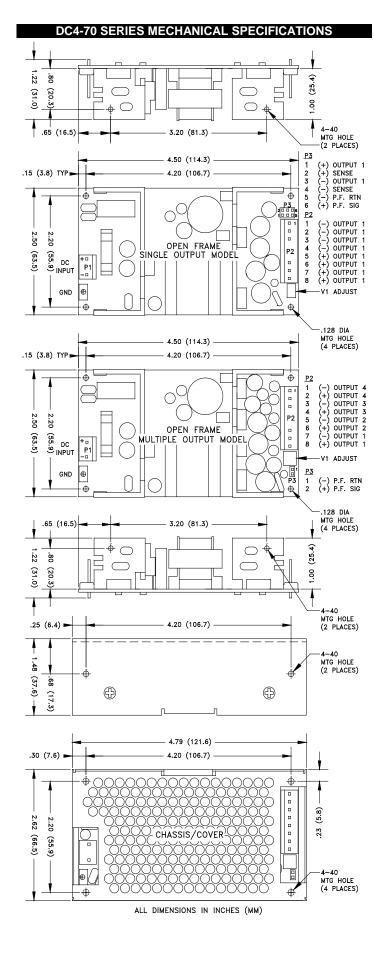


All specifications are maximum at 25° C/70W unless otherwise stated, may vary by model and are subject to change without notice.

Reflected Ripple Current

- Each output can deliver its rated current but Total Output Power must not exceed 70W 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.
- 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.
- 7. 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 (single output models only). 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.
- Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
- 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 50W with convection cooling on open-frame models except
 where part d
- Total Power must not exceed 70W with 300LFM forced-air cooling on open-frame models.
- 15. Total Power must not exceed 40W with convection cooling and Chassis/Cover option.
- Total Power must not exceed 70W with 300LFM forced-air cooling and Chassis/Cover option.
- 17. Rated 10A maximum with convection cooling.
- 18. Rated 1.5A maximum with convection cooling.

CONNECTOR SPECIFICATIONS Р1 DC Input 0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal. P2 DC Output 0.156 friction lock header mates with Tyco 770849-8 or (Single) equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal. P2 DC Output 0.156 friction lock header mates with Tyco 770849-8 or (Multiple) equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal. 0.187 quick disconnect terminal. G Ground P3 P.G./Sense 0.100 breakaway header mates with Molex 22-55-2061 or (Single) equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal. P3 0.100 breakaway header mates with Molex 50-57-9002 or Power Good (Multiple) equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.



- Compact 3" x 5" x 1.3" Size
- 2 Year Warranty
- 36-72VDC Input
- One to Four Outputs
- 4242VDC Reinforced Insulation
- Under/Overvoltage Lockout
- IEC 60601-1 3rd ed. Medical Cert.
- IEC 60950-1 2nd ed. ITE Certification
- 0-70°C Operating Temperature
- RoHS Compliant
- Optional Chassis/Cover
- Power Good Signal
- Size/Pin Compatible with REL-110 Series





CHASSIS/COVER

OPEN FRAME

	SAFETY SPEC	CIFICATIONS
c FL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c PL us	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 SUD Name and American	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1 ₍₂₀	OUTPUT	2 ₍₂₀₎ OUTPUT	3 ₍₁₉₎ OUTPUT 4	(19)
DC4-110-4001	+3.3V/10A ₍₁₇₎	+5V/6A	+12V/2A	-12V/2A	
DC4-110-4002	+5V/10A ₍₁₇₎	+3.3V/6A	+12V/2A	-12V/2A	
DC4-110-4003	+5V/10A ₍₁₇₎	+3.3V/6A	+15V/2A	-15V/2A	
DC4-110-4004	+5V/10A ₍₁₇₎	-5V/6A	+12V/2A	-12V/2A	
DC4-110-4005	+5V/10A ₍₁₇₎	-5V/6A	+15V/2A	-15V/2A	
DC4-110-4006	+5V/10A ₍₁₇₎	+24V/2A	+12V/2A	-12V/2A	
DC4-110-4007	+5V/10A ₍₁₇₎	+24V/2A	+15V/2A	-15V/2A	
DC4-110-3001	+5V/10A ₍₁₇₎	+12V/3A		-12V/3A	
DC4-110-3002	+5V/10A ₍₁₇₎	+15V/2A		-15V/2A	
DC4-110-2001	+3.3V/10A(17)	+5V/6A			
DC4-110-2002	+5V/10A ₍₁₇₎	+12V/5A			
DC4-110-2003	+5V/10A(17)	+24V/3A			
DC4-110-2004	+12V/5A	-12V/4A			
DC4-110-2005	+15V/4A	-15V/3A			
DC4-110-1001	2.5V/22A ₍₁₈₎				
DC4-110-1002	3.3V/22A ₍₁₈₎				
DC4-110-1003	5V/22A ₍₁₈₎				
DC4-110-1004	12V/9.2A				
DC4-110-1005	15V/7.3A				
DC4-110-1006	24V/4.6A				
DC4-110-1007	28V/3.9A				
DC4-110-1008	48V/2.3A				

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 I/O - Isolated Outputs CO - Cover TS - Terminal Strip

BD - Reverse Input Protection

	PUT SPECIF	
Total Output Power at 50°C ₍₁₎	80W	Convection Cooled _(13, 15)
(See Derating Chart)	110W	300LFM Forced-Air Cooled _(12, 14, 16)
Output Voltage Centering	Output 1:	± 0.5% (All outputs
	Output 2:	± 5.0% at 50% load)
	Output 3:	± 5.0%
	Output 4:	± 5.0%
Output Voltage Adjust Range	Output 1:	95 - 105%
Load Regulation	Output 1:	0.5% (10-100% load change)
	Output 2:	5.0%
	(4001-5 Models)	8.0%
	(2001 Model)	6.0%
	Output 3:	5.0%
	Output 4:	5.0%
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	
Voltage Deviation	5.0%	
Recovery Time	500μS	
Load Change	50% to 100%	
Output Overvoltage Protection	Output 1:	110% to 150%
Output Overpower Protection		Pout, cycle on/off, auto recovery
Start Up Time	5 Seconds	
INF	PUT SPECIFIC	CATIONS
Input Voltage Range	36-72 VDC	
Input Under-Voltage Lockout		
Turn-On Voltage	29.0-35.0 VDC	
Turn-Off Voltage	28.0-34.0 VDC	
Input Overvoltage Shutdown	77.0-85.0 VDC	
Maximum Input Current	4.2 A	
Reflected Ripple Current	5 %	
Efficiency		ower, 48VDC, varies by model
ENVIRON	IMENTAL SP	ECIFICATIONS
Ambient Operating	0°C to + 70°C	
Temperature Range	Derating: See Po	wer Rating Chart
Ambient Storage Temp. Range	- 40°C to + 85°C	
Temperature Coefficient	Outputs 1 – 4:	0.02%/°C
GEN	ERAL SPECIF	FICATIONS
Means of Protection		
Primary to Secondary	2MOOP (Means	of Operator Protection)
Primary to Ground		of Operator Protection)
Secondary to Ground		ation(Consult factory for 1MOOP or 1MOPF
Dielectric Strength _(7, 8)		. ,
Reinforced Insulation	4242 VDC, Prima	ary to Secondary
Basic Insulation	2121 VDC, Prima	
Operational Inculation	707 VDC C000	ndary to Cround

POWER vs. AMBIENT TEMPERATURE **MAXIMUM OUTPUT**

0.65 Lbs. 1.15 Lbs.

707 VDC, Secondary to Ground Logic high with input voltage above Vin min.

250mV compensation of output cable losses

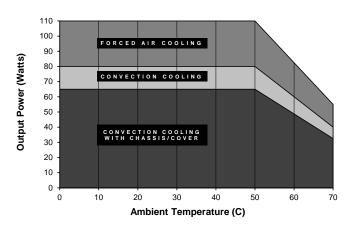
Chassis and Cover

100,000 Hours min., MIL-HDBK-217F, 25° C, GB Open Frame

Operational Insulation

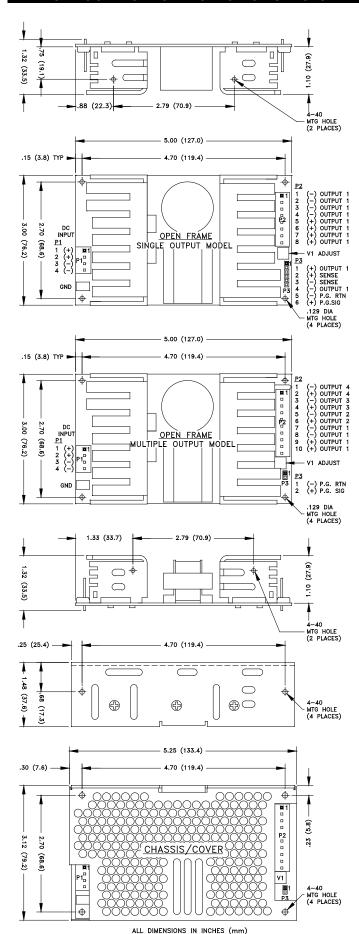
Remote Sense (singles only)(9) Mean-Time Between Failures

Power Good Signal₍₁₁₎



All specifications are maximum at 25°C/110W unless otherwise stated, may vary by model and are subject to change without notice.

DC4-110 SERIES MECHANICAL SPECIFICATIONS



APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 110W
 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.
- 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.
- 7. 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 (single output models only). 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.
- Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
- 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 80W with convection cooling on open-frame models except where noted.
- Total Power must not exceed 110W with 300LFM forced-air cooling on open-frame models.
- 15. Total Power must not exceed 65W with convection cooling and Chassis/Cover option.
- Total Power must not exceed 110W with 300LFM forced-air cooling and Chassis/Cover option.
- 17. Rated 8A maximum with convection cooling.
- 18. Rated 16A maximum with convection cooling.
- 19. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
- 20. Total current from Outputs 1 & 2 must not exceed 12A with convection cooling.

		CONNECTOR SPECIFICATIONS
P1	DC Input	0.156 friction lock header mates with Tyco 640250-4 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.
P2	DC Output (Single)	0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.
P2	DC Output (Multiple)	0.156 friction lock header mates with Tyco 1-770849-0 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	P.G./Sense (Single)	0.100 breakaway header mates with Molex 50-57-9006 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
P3	P.G. (Multiple)	0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.

- Compact 3.8" x 5" x 1.3" Size
- 2 Year Warranty
- 36-72VDC Input
- One to Four Outputs
- 4242VDC Reinforced Insulation
- Under/Overvoltage Lockout
- IEC 60601-1 3rd ed. Medical Cert.
- IEC 60950-1 2nd ed. ITE Certification
- 0-70°C Operating Temperature RoHS Compliant
- Optional Chassis/Cover
- Power Good Signal

• Size/Pin Compatible with REL-150 Series



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OPEN FRAME

	SAFETY SPEC	CIFICATIONS
	Underwriters Laboratories	UL 60950-1:2007, 2 nd Edition
C 7 US	File E137708/E140259	AAMI/ANSI ES60601-1:2005/(R) 2012
		CB Reports/Certificates (including all
TEGEF		National and Group Deviations)
CB		IEC 60950-1/A2:2013, 2nd Edition
SCHEME		IEC 60601-1:2005/A1:2012
	UL Recognition	CAN/CSA-C22.2 No. 60950-1-07. 2nd Edition
c Fl. us	Mark for Canada	CAN/CSA-C22.2 No. 60601-1:2014
	File E137708/E140259	37117 3371 322.2 110. 33301 1.2011
5		EN 60950-1/A2:2013, 2nd Edition
SUD	TUV	EN 60601-1:2006/A1:2013
in land		
	5 110 51 11 (5 1)	(0044)/5/5/1 (1 0044)
LE	RoHS Directive (Recast)	(2011/65/EU of June 2011)
-		

MODEL LISTING

MODEL	OUTPUT 1 ₍₂₀	OUTPUT 2	2 ₍₂₀₎ OUTPUT 3	G ₍₁₉₎ OUTPUT 4 ₍₁₉₎
DC4-150-4001	+3.3V/15A ₍₁₇₎	+5V/8A	+12V/2A	-12V/2A
DC4-150-4002	+5V/15A ₍₁₇₎	+3.3V/8A	+12V/2A	-12V/2A
DC4-150-4003	+5V/15A ₍₁₇₎	+3.3V/8A	+15V/2A	-15V/2A
DC4-150-4004	+5V/15A ₍₁₇₎	-5V/8A	+12V/2A	-12V/2A
DC4-150-4005	+5V/15A ₍₁₇₎	-5V/8A	+15V/2A	-15V/2A
DC4-150-4006	+5V/15A ₍₁₇₎	+24V/3A	+12V/2A	-12V/2A
DC4-150-4007	+5V/15A ₍₁₇₎	+24V/3A	+15V/2A	-15V/2A
DC4-150-3001	+5V/15A ₍₁₇₎	+12V/4A		-12V/3A
DC4-150-3002	+5V/15A ₍₁₇₎	+15V/3A		-15V/2A
DC4-150-2001	+3.3V/15A(17)	+5V/8A		
DC4-150-2002	+5V/15A ₍₁₇₎	+12V/5A		
DC4-150-2003	+5V/15A ₍₁₇₎	+24V/3A		
DC4-150-2004	+12V/7.5A	-12V/5A		
DC4-150-2005	+15V/5A	-15V/5A		
DC4-150-1001	2.5V/30A ₍₁₈₎			
DC4-150-1002	3.3V/30A ₍₁₈₎			
DC4-150-1003	5V/30A ₍₁₈₎			
DC4-150-1004	12V/12.5A			
DC4-150-1005	15V/10.0A			
DC4-150-1006	24V/6.3A			
DC4-150-1007	28V/5.4A			
DC4-150-1008	48V/3.1A			

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

BD - Reverse Input Protection

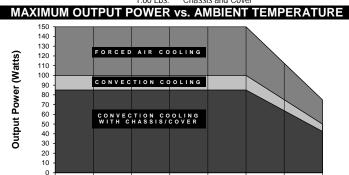
I/O - Isolated Outputs TS – Terminal Strip

OUTPUT SPECIFICATIONS					
Total Output Power at 50°C ₍₁₎	100W	Convection	n Cooled _(13, 15)		
(See Derating Chart)	150W	300LFM Forced-Air _(12, 14, 16)			
Output Voltage Centering	Output 1:	± 0.5%	(All outputs		
	Output 2:	$\pm 5.0\%$	at 50% load)		
	Output 3:	$\pm 5.0\%$			
	Output 4:	$\pm 5.0\%$			
Output Voltage Adjust Range	Output 1:	95 - 105%			
Load Regulation	Output 1:	0.5%	(10-100% load change)		
	Output 2:	5.0%	(10-100% load change)		
	(4001-5 Models)	8.0%	(20-100% load change)		
	(2001 Model)	6.0%	(20-100% load change)		
	Output 3:	5.0%	(10-100% load change)		
	Output 4:	5.0%	(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	Outputs 1 – 4				
Voltage Deviation	5.0%				
Recovery Time	500μS				
Load Change	50% to 100%				
Output Overvoltage Protection	Output 1:	110% to 15	0%		
Output Overpower Protection	110-160% rated F	Pout, cycle o	on/off, auto recovery		
Start Up Time	5 Seconds				
INPL	JT SPECIFIC	ATION	S		
Input Voltage Range	36-72 VDC				
	•		•		

Input Under-Voltage Lockout	
Turn-0n Voltage	29.0-35.0 VDC
Turn-off Voltage	28.0-34.0 VDC
Input Overvoltage Shutdown	77.0-85.0 VDC
Maximum Input Current	6.0 A
Reflected Ripple Current	5 %
Efficiency	82% Typ., Full Power, 48 VDC, varies by model
ENVIRONMEN'	TAL SPECIFICATIONS
Ambient Operating	0°C to + 70°C
Temperature Range	Derating: See Power Rating Chart
4 11 101 T D	

	TIME OF EOIL IN		
Ambient Operating	0°C to + 70°C		
Temperature Range	Derating: See Powe	er Rating Chart	
Ambient Storage Temp. Range	- 40°C to + 85°C		
Temperature Coefficient	Outputs 1 – 4:	0.02%/°C	
GEN	ERAL SPECIFI	CATIONS	
Means of Protection			

Means of Protection			
Primary to Secondary	2MOOP (Means of Operator Protection)		
Primary to Ground	1MOOP (Means of Operator Protection)		
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)		
Dielectric Strength _(7, 8)			
Reinforced Insulation	4242 VDC, Primary to Secondary		
Basic Insulation	2121 VDC, Primary to Ground		
Operational Insulation	707 VDC, Secondary to Ground		
Power Good Signal ₍₁₁₎	Logic high with input voltage above Vin min.		
Remote Sense ₍₉₎	250mV compensation of output cable losses		
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB		
Weight	0.90 Lbs. Open Frame		
	1.60 Lhs Chassis and Cover		



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

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Ambient Temperature (C)

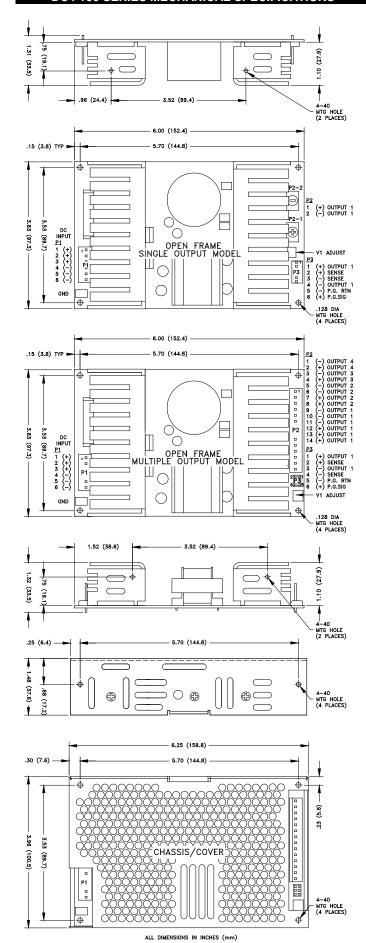
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DC4-150 SERIES MECHANICAL SPECIFICATIONS



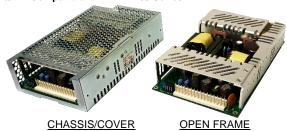
APPLICATIONS INFORMATION

- Each output can deliver its rated current but Total Output Power must not exceed 150W 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.
- 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.
- 7. 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.
- Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
- 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 100W with convection cooling on open-frame models except where noted.
- Total Power must not exceed 150W with 300LFM forced-air cooling on open-frame models.
- 15. Total Power must not exceed 85W with convection cooling and Chassis/Cover option.

 16. Total Power must not exceed 150W with 2001 EM forced air cooling and Chassis/Cover
- Total Power must not exceed 150W with 300LFM forced-air cooling and Chassis/Cover option.
- 17. Rated 12A maximum with convection cooling.
- 18. Rated 20A maximum with convection cooling.
- 19. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
- 20. Total current from Outputs 1 & 2 must not exceed 15A with convection cooling

		CONNECTOR SPECIFICATIONS
P1	DC Input	0.156 friction lock header mates with Molex 09-50-3061 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 09-50-3141 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	P.G./Sense (Single)	0.100 breakaway header mates with Molex 50-57-9006 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
P3	P.G./Sense (Multiple)	0.100 breakaway header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex type 70058 or equivalent crimp terminal.

- Compact 4.2" x 7.0" x 1.5" Size IEC 60601-1 3rd ed. Medical Cert.
- 2 Year Warranty
- 36-72VDC Input
- One to Four Outputs
- 4242VDC Reinforced Insulation Optional Chassis/Cover
- Under/Overvoltage Lockout
- IEC 60950-1 2nd ed. ITE Certification • 0-70°C Operating Temperature
- RoHS Compliant
- Power Good Signal
- Size/Pin Compatible with REL-185 Series



	SAFETY SPE	CIFICATIONS
c FL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2 nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c FLL us	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	TUV	EN 60950-1/A2:2013, 2 nd Edition EN 60601-1:2006/A1:2013
	Dalic Disastina (Danast)	(2014)/F/FILL of I.m. 2014)



RoHS Directive (Recast)

(2011/65/EU of June 2011)

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MODEL	OUTPUT 1 ₍₂₀	OUTPUT	2 ₍₂₀₎ OUTPUT 3	$3_{(19)}$ OUTPUT $4_{(19)}$
DC4-185-4001	+3.3V/20A(17)	+5V/10A	+12V/2A	-12V/2A
DC4-185-4002	+5V/20A(17)	+3.3V/10A	+12V/2A	-12V/2A
DC4-185-4003	+5V/20A(17)	+3.3V/10A	+15V/2A	-15V/2A
DC4-185-4004	+5V/20A ₍₁₇₎	-5V/10A	+12V/2A	-12V/2A
DC4-185-4005	+5V/20A(17)	-5V/10A	+15V/2A	-15V/2A
DC4-185-4006	+5V/20A ₍₁₇₎	+24V/3A	+12V/2A	-12V/2A
DC4-185-4007	+5V/20A ₍₁₇₎	+24V/3A	+15V/2A	-15V/2A
DC4-185-3001	+5V/20A ₍₁₇₎	+12V/5A		-12V/3A
DC4-185-3002	+5V/20A(17)	+15V/4A		-15V/3A
DC4-185-2001	+3.3V/20A(17)	+5V/10A		
DC4-185-2002	+5V/20A(17)	+12V/8A		
DC4-185-2003	+5V/20A(17)	+24V/4A		
DC4-185-2004	+12V/10A	-12V/6A		
DC4-185-2005	+15V/8A	-15V/5A		
DC4-185-1001	2.5V/37A ₍₁₈₎			
DC4-185-1002	3.3V/37A ₍₁₈₎			
DC4-185-1003	5V/37A ₍₁₈₎			
DC4-185-1004	12V/15.4A			
DC4-185-1005	15V/12.3A			
DC4-185-1006	24V/7.7A			
DC4-185-1007	28V/6.6A			
DC4-185-1008	48V/3.8A			

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 I/O - Isolated Outputs CO - Cover TS - Terminal Strip

BD - Reverse Input Protection

OUT	PUT SPECIF	ICATIO	ONS
Total Output Power at 50°C ₍₁₎	135W	Convecti	on Cooled _(13, 15)
(See Derating Chart)	185W		Forced-Air _(12, 14, 16)
Output Voltage Centering	Output 1:	$\pm 0.5\%$	(All outputs
	Output 2:	$\pm 5.0\%$	at 50% load)
	Output 3:	$\pm 5.0\%$	
	Output 4:	± 5.0%	
Output Voltage Adjust Range	Output 1:	95 - 1059	%
Load Regulation	Output 1:	0.5%	(10-100% load change)
	Output 2:	5.0%	(20-100% load change)
	(4001,4,5,2001)	10.0%	(20-100% load change)
	(4002,3)	15.0%	
	Output 3:	5.0%	
	Output 4:	5.0%	
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 1	
Output Overpower Protection		Pout, cycle	e on/off, auto recovery
Start Up Time	5 Seconds		
INF	PUT SPECIFIC	CATION	NS
Input Voltage Range	36-72 VDC		
Input Under-Voltage Lockout			
Turn-On Voltage	29.0-35.0 VDC		
Turn-Off Voltage	28.0-34.0 VDC		
Input Overvoltage Shutdown	77.0-85.0 VDC		
Maximum Input Current	7.0 A		
Reflected Ripple Current	5 %		
Efficiency	84% Typ., Full P	ower, 48VI	DC, varies by model
ENVIRON	IMENTAL SP	ECIFIC	ATIONS
Ambient Operating	0°C to + 70°C		
Temperature Range	Derating: See Po	ower Rating	g Chart
Ambient Storage Temp. Range	- 40°C to + 85°C	,	
Temperature Coefficient	Outputs 1 – 4:		%/°C
	ERAL SPECII		
Means of Protection			<u></u>
Reinforced Insulation	2MOOP (Means	of Operato	or Protection)
Reinforced Insulation	2MOOP (Means of Operator Protection) 1MOOP (Means of Operator Protection)		
Reinforced Insulation	Operational Insulation(Consult factory for 1MOOP or 1MOPP)		
Dielectric Strength _(7, 8)			, , , , , , , , , , , , , , , , , , ,
Reinforced Insulation	4242 VDC, Primary to Secondary		
Basic Insulation	2121 VDC, Primary to Ground		
Operational Insulation	707 VDC, Seco		
Power Good Signal ₍₁₁₎	Logic high with ir		
Remote Sense (singles only) ₍₉₎			itput cable losses
Mean-Time Between Failures			DBK-217F, 25° C, GB
Woight	1.20 l.hc. On		,

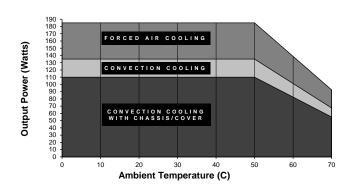
POWER vs. AMBIENT TEMPERATURE

1.28 Lbs.

2 16 l bs

Open Frame

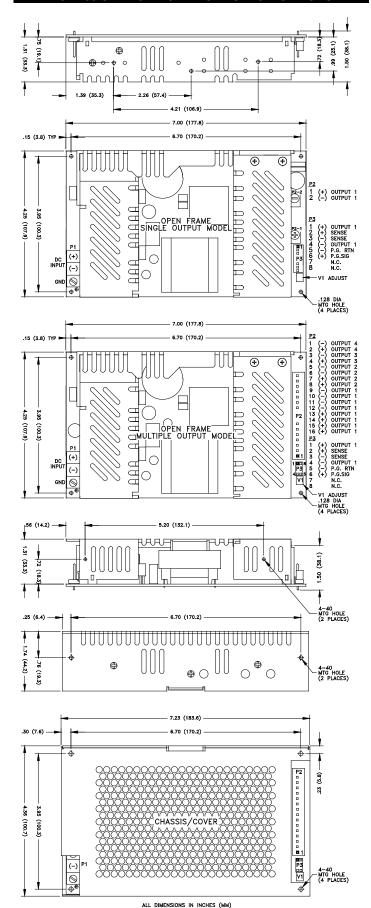
Chassis and Cover



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

Weight

DC4-185 SERIES MECHANICAL SPECIFICATIONS



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.
- 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.
- 7. 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.
- Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
- 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.
- 15. 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.
- 17. Rated 15A maximum with convection cooling.
- 18. Rated 27A maximum with convection cooling.
- 19. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
- 20. Total current from Outputs 1 & 2 must not exceed 20A with convection cooling.

CONNECTOR SPECIFICATIONS DC Input #6 standard (3)position terminal block P2 DC Output 6-32 screw down terminal mates with #6 ring tongue (Single) terminal. (10 in-lb max) P2 DC Output 0.156 friction lock header mates with Molex 09-50-3161 or (Multiple) equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal. Ground 0.187 quick disconnect terminal. P3 0.100 breakaway header mates with Molex 50-57-9008 or P.G./Sense (Single) equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal. P3 P.G./Sense 0.100 breakaway header mates with Molex 22-55-2081 or (Multiple) equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.