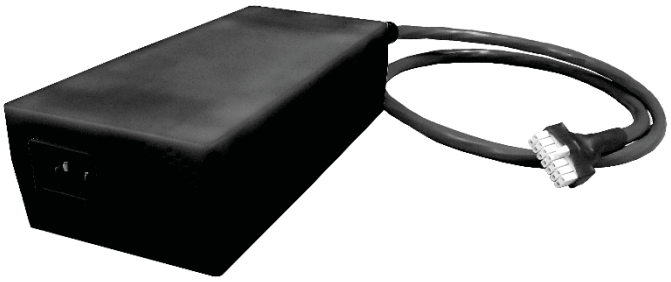
120 WATTS

SINGLE/MULTI OUTPUT AC-DC

Advance Product Bulletin

FEATURES:

- **Compact Size 8" x 4" x 2"**
- **3 Year Warranty**
- **Universal 85-264VAC Input**
- **Single, Dual or Triple Outputs**
- **>90% Peak Efficiency**
- **Meets DoE Level VI Efficiency**
- **Meets CoC Tier I Efficiency(6)**
- **IEC 60601-1:06/A1:13 Medical Cert.**
- **IEC 62368-1:2014 AV,ITE,CTE Cert.**
- **IEC 60601-1-2 4th ed. EMC**
- **Class B Emissions per CISPR 11/24**
- **-20 to +50°C Operating Temperature**
- **Optional Class II EC320-C8 AC Inlet**
- **RoHS Compliant**



SAFETY SPECIFICATIONS

c UL us	UL-Listed File E137708	UL 62368-1:2014, 2nd Edition CAN/CSA C22.2 No. 62368-1-14
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 62368-1:2014, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	UL Recognition File E140259	AAMI/ANSI ES60601-1:2005/(R) 2012 CAN/CSA-C22.2 No. 60601-1:2014
TUV SUD	TUV	EN 62368-1:2014, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast) EMC Directive	(2014/35/EU of February 2014) (2011/65/EU of June 2011) (2014/30/EU of March 2014)

MODEL LISTING

MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3
ELS-120-3001	+5V/12A	+24V/3A	-12V/1A
ELS-120-3002	+5V/12A	+24V/3A	-15V/1A
ELS-120-3003	+5V/12A	+12V/3A	-12V/2A
ELS-120-3004	+5V/12A	+15V/2A	-15V/2A
ELS-120-3005	+5V/12A	+24V/3A	-24V/1A
ELS-120-3006	+12V/7A	+24V/1A	-5V/2A
ELS-120-3007	+24V/4A	+5V/2A	-12V/1A
ELS-120-3008	+24V/4A	+5V/2A	-15V/1A
ELS-120-2001	+5V/12A	+12V/5A	
ELS-120-2002	+5V/12A	+15V/4A	
ELS-120-2003	+5V/12A	+24V/3A	
ELS-120-2004	+12V/9A	+5V/3A	
ELS-120-2005	+12V/8A	-12V/2A	
ELS-120-2006	+12V/8A	+15V/2A	
ELS-120-2007	+12V/8A	+24V/1A	
ELS-120-2008	+15V/8A	-15V/2A	
ELS-120-2009	+24V/4A	+12V/2A	
ELS-120-2010	+24V/4A	+15V/2A	
ELS-120-1001(6)	12V/10A		
ELS-120-1002(6)	15V/8A		
ELS-120-1003(6)	24V/5A		

ORDERING INFORMATION

Consult factory for alternate output configurations.
Please specify the following optional features when ordering:
BF – Type BF
IO – Isolated Outputs
C2 – Class II AC Input

OUTPUT SPECIFICATIONS

Output Power at 40°C(1)	120W	Internal Fan Cooled
Voltage Centering	Output 1:	± 0.5% (all outputs at 50% load)
	Outputs 2 & 3:	± 5.0% (all outputs at 50% load)
Voltage Adjust Range	Output 1:	95-105%
Load Regulation	Output 1:	± 0.5% (0-100% load change)
	Outputs 2 & 3:	±5.0% (10-100% load change)
	Output 2:	± 6.0% (2004, 20-100% load change)
	Output 3:	± 6.0% (3006-3008, 20-100% load change)
Source Regulation	Outputs 1-3:	0.5%
Cross Regulation	Outputs 2 & 3:	5.0%
Ripple & Noise	Outputs 1-3:	1.0% or 100mV 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, 500µs maximum, 4% maximum deviation.	
Overvoltage Protection	Latching, between 110% and 150% of rated output voltage.	
Overpower Protection	110-150% rated P_{OUT}, cycle on/off, auto recovery	
Hold-Up Time	25ms minimum, full power	
Start-Up Time	<1 sec., 115/230V Input	
Output Rise Time	25ms typical	
Minimum Load (2)	No minimum load required	

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 VAC (see derating chart)
Source Frequency	47 – 63 Hz
Input Protection	Dual internal 5A time-delay fuses, 1,500A breaking capacity
Peak Inrush Current	40A max.
Peak Efficiency	Up to 90%
Average Efficiency	>86% Multis., >88% Singles DoE Level VI (115/230VAC) >89% Singles, CoC Tier I (230VAC)
No-Load Input Power	<300mW, Multis., DoE Level VI 115/230VAC <210mW, Singles., DoE Level VI 115/230VAC

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temp. Range	-20 to +50°C, Derating (see derating requirements)
Ambient Storage Temp. Range	-40 to +85°C
Operating Relative Humidity Range	20-90% non-condensing
Altitude	3,000m ASL Operating
Temperature Coefficient	0.02%/°C
Vibration (MIL-STD-810G)	2.5G swept sine, 10-2,000Hz, 1 octave/min., 3 axis, 1 hour each
Shock (MIL-STD-810G)	20G, 11ms, 3 axis.

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 (1MOPP w/ Option BF)
Dielectric Strength(4, 5)	
Reinforced Insulation	5,656 VDC (4,000VAC)
Basic Insulation	2,121 VDC (1,500VAC)
Operational Insulation	707 VDC (500VAC)/2,121VDC(1,500VAC) w/ Option BF
Leakage Current	
Earth Leakage	<300µA NC, <1,000µA SFC
Touch Current	<100µA NC, <500µA SFC
Patient Leakage Current	<100µA NC, <500µA SFC
Power Fail Signal	Logic low with input power failure 9ms prior to loss of Output 1.
Switching Frequency	PWM:65KHz/PFC:Variable
Mean-Time Between Failures	>200,000 hours, MIL-HDBK-217F, 25° C, GB
Weight	2.33 lbs.

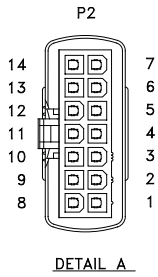
EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4TH ed./IEC 61000-6-2:2016)

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
Surges	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 cycle, 0°	100/240V A/A
		40% U_T, 12 cycles, 0°	100/240V B/A
		70% U_T, 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, FCC Part 15		Class B
Conducted Emissions	EN 55011/32, FCC Part 15		Class B
Harmonic Current Emissions	EN 61000-3-2		Class A
Voltage Fluctuations/Flicker	EN 61000-3-3		Complies

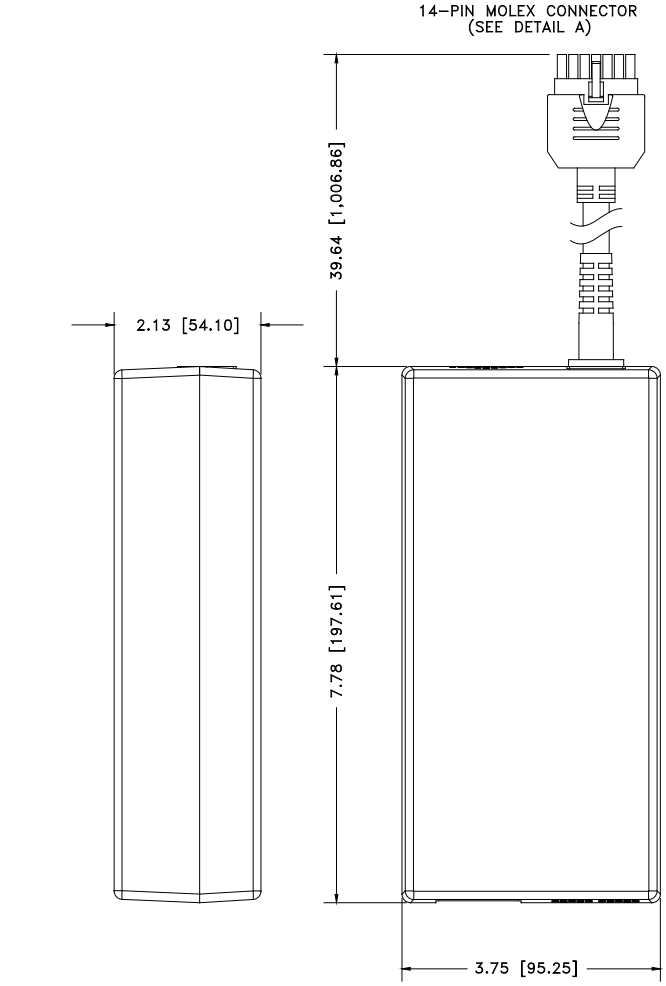
All specifications are maximum at 25°C, 120W unless otherwise stated, may vary by model and are subject to change without notice.

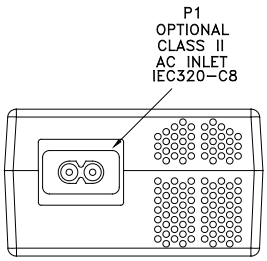
PENDING

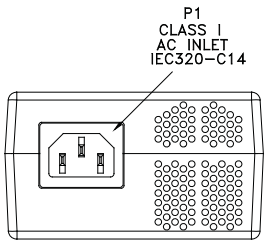
GRN-200 SERIES MECHANICAL SPECIFICATIONS



DC OUTPUT
P1–1: (+) OUTPUT 1
P1–2: (+) OUTPUT 1
P1–3: (+) OUTPUT 1
P1–4: (+) OUTPUT 1
P1–5: (+) SENSE
P1–6: (+) OUTPUT 2
P1–7: (+) OUTPUT 3
P1–8: (–) OUTPUT 1
P1–9: (–) OUTPUT 1
P1–10: (–) OUTPUT 1
P1–11: (–) OUTPUT 1
P1–12: (–) SENSE
P1–13: (–) OUTPUT 2
P1–14: (–) OUTPUT 3



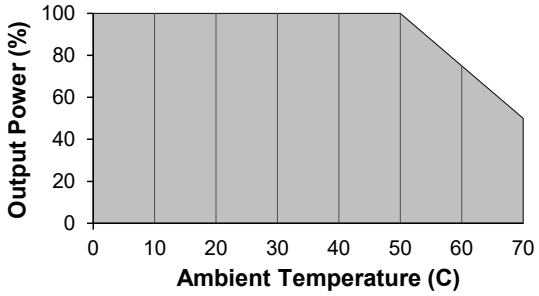




APPLICATIONS INFORMATION

1. Each output can deliver its rated current but Total Output Power must not exceed 120W.
2. Minimum load is not required for reliable operation. However, a 10% load may be required on Output 1 when loading Outputs 2 or 3.
3. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power cord, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20MHz bandwidth, with each output terminated with a 0.1µF multilayer ceramic and a 10µF low-ESR electrolytic capacitor.
4. 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.
5. 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.
6. Meets CoC Tier I Efficiency on single output models.

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



Rev. D 05/09/18