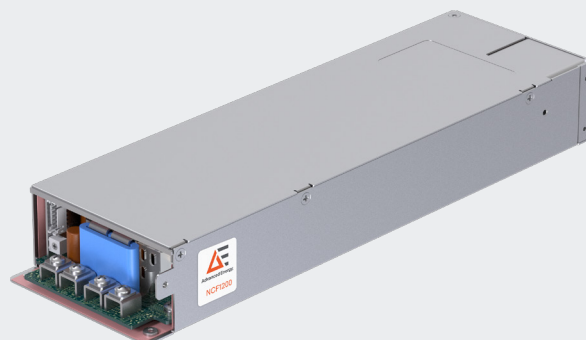


NCF1200 SERIES

1200 W Single Output
Medical Grade - CF Rated



Medical



Advanced Energy's NCF1200 CF rated medically approved AC-DC power supplies are available with a nominal main output of 12 V, 15 V, 24 V or 48 V. NCF1200 series power supplies provide up to 1200 W of output power. All models have output overvoltage, short circuit and overload protection and a 11.8 x 3.5 x 1.65 inch form factor.

AT A GLANCE

Total Power

1200 W

Input Voltage

85 to 264 VAC

of Outputs

Single

SPECIAL FEATURES

- 5 kV Defibrillator Withstand
- Up to 1200 W
- 3.5"W x 11.8"L x 1.65"H Size
- Universal Input 85 to 264 VAC
- Meets Class B Emissions Levels
- 7+ Years Electrolytic Capacitor Life
- Meets EN60601-1-2 4th Edition EMC
- Less than 10 μ A Leakage Current
- Class I Input
- RoHS, REACH Compliant
- Includes 5 V Standby Output
- 3 Years Warranty

SAFETY

- IEC/UL/cUL/EN60601-1, Edition 3.2
- CF Rated*



* The NCF Series models are suitable for CF Rated applications as they provide the below features:

1. Clearance and Creepage requirements between Primary and Ground for one MOPP, Primary and Secondary for two MOPP and Secondary and Ground for one MOPP.
2. Hi-pot tests between Primary and Ground, Primary and Secondary and Secondary and Ground.
3. Type CF Patient Leakage Current <10 μ A under Normal Condition and <50 μ A under Single Fault Condition

Note: As the NCF Series is classified as a component power supply, it cannot be declared an Applied Part, and therefore cannot be declared CF Rated. However, the NCF Series has been evaluated for and meets the requirements related for use in CF applications.

ELECTRICAL SPECIFICATIONS

Input			
Input Range	85 to 264 VAC, 47 to 63 Hz, 1Ø. Safety certified 100 to 240 VAC, ±10%		
Input Current	15 A max at 115 VAC, 7.5 A max at 230 VAC		
Inrush Current	40 A peak, cold start at 264 VAC input		
Input Fuses	20 A, 250 VAC fuse provided in both line & neutral		
Leakage Current - Type CF	Typical PSU Performance	IEC60601-1 Limits	
Earth Leakage Current (Input - Earth)	<420 µA under NC @ 264Vac, 60 Hz input <840 µA under SFC @ 264Vac, 60 Hz input	<5 mA under NC @ 264Vac, 60 Hz input <10 mA under SFC @ 264Vac, 60 Hz input	IEC60601-1, Ed 3.2, Figure 13
Patient Leakage Current (Input - Output)	<7.5 µA under NC @ 264Vac, 60 Hz input <15 µA under SFC @ 264Vac, 60 Hz input	<10 uA under NC @ 264Vac, 60 Hz input <50 uA under SFC @ 264Vac, 60 Hz input	IEC60601-1, Ed 3.2, Figure 15
Patient Leakage Current (Output - Earth)	<42 µA under NC @ 264Vac, 60 Hz input	<50 uA under NC @ 264Vac, 60 Hz input	IEC60601-1, Ed 3.2, Figure 16
Efficiency	>90% typical		
No Load Input Power	<2.0 W (with main output inhibited, no load on 5V standby)		
Isolation Voltage - CF Rated	Input-Earth: 1500 VAC (1 MOPP) Input-Output: 4000 VAC (2 MOPP) ¹ Output-Earth: 1500 VAC (1 MOPP) 5 kV Defibrillator Pulse Withstand ² Complies with CF Rated application requirements		
Output			
Maximum Power	See "Ordering Information" section		
Ripple and Noise	1% of Vout on all models		
Load Regulation	2%		
Line Regulation	1%		
Total Regulation	5%		
Minimum Load	Not required		
Capacitive Load	1000 µF		
Adjustment Range	±5% (optional)		
Initial Set Point Tolerance	±1%		
Overshoot	<5% overshoot at turn-on, <1% overshoot at turn-off, under all conditions		
Transient Response	500 µs response time for return to within 0.5% of final value, for any 50% load step over the range of 25% to 100% of rated load, Δi/Δt<0.2 A/µs. Max. voltage deviation is ±3.5% of final value		
Standby Output	5 V/2 A		
DC OK Signal	Logic high when DC output is within regulation		
Inhibit Signal	On = open or logic high; Off = Short to RTN or logic low		
Reliability			
MTBF	>500 khrs per Telcordia 332, Issue 6 at 110 VAC input, 25°C, full rated load		
Warranty	3 years		
Electrolytic Capacitor Lifetime	All specified electrolytic capacitors will exceed 10 years life based on operating at 25°C ambient temperature, 115 VAC/60 Hz and 230 VAC/50 Hz, 24 hrs/day, 365 days/year		
Protection			
Overvoltage Protection	110% to 130% of nominal output voltage, hiccup mode, auto-recovery		
Short circuit Protection	Short across the output terminals will not cause damage to the unit, hiccup mode		
Thermal Protection	Will shutdown upon an over temperature condition, auto-recovery		
Overload Protection	110% to 180% of rated output current value, hiccup mode		

Note 1: With chassis, output to ground add Y1-cap 4700 pF.

Note 2: Meets the Common Mode Test and Energy Reduction Test per Figures 9 and 11 of IEC60601-1. Ed. 3.2.

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-10°C to +70°C
Temperature Derating	Derate output power linearly from 50°C to 70°C, 50% load at 70°C
Cooling	Built in variable speed fan
Storage Temperature	-40°C to +85°C
Altitude	Operating: -500 to 5,000 m. Non-operating: -500 to 12,192 m
Relative Humidity	5% to 95%, non-condensing
Vibration	Random Vibration: Operating: 0.003 g/Hz, 1.5 g overall, 3 axes, 10 min/axis, 5 to 500 Hz Non-operating: Random waveform, 3 mins/axis, 3 axes and sine waveform, Vib. frequency/acceleration: 10 Hz to 500 Hz/1 g, sweep rate of 1 octave/minutes, vibration time of 10 sweeps/axis, 3 axes, per IEC60068-2 Transportation vibration: Random vib. per ISTA-1A
Shock	Operating: Half-sine, 20 gpk, 10 ms, 3 axes, 6 shocks total Non-operating: Half-sine waveform, impact acceleration of 25 g, pulse duration of 6 ms Number of shocks: 3 for each of the three axes
Audible Noise	<70 dbA @ 100% rated output, <60 dbA @ 75% rated output, <55 dbA @ 50% rated output, <45 dbA @ 25% rated output

EMI/EMC COMPLIANCE

Conducted Emissions	EN55011/32: Class B, CISPR11/15/32: Class B, FCC Part 15.107, Class B Measured at 25%, 50%, and 100% load steps; 3db margin typ, at 120 VAC and 230 VAC
Radiated Emissions	EN55011/32: Class B, CISPR11/32: Class B, FCC Part 15.107, Class B Measured at 25%, 50%, and 100% load steps; at 120 VAC and 230 VAC (ferrite on input may be required)
Harmonic Current Emissions	EN61000-3-2, Class A at 230 VAC, 100% load
Voltage Fluctuations & Flicker	IEC61000-3-3
Electro Static Discharge Immunity	IEC61000-4-2, Level 4: ±8 kV contact, ±15 kV air, Criteria A, IEC60601-1-2, 4th Edition, Table 4
Radiated RF EM Fields Susceptibility	EN61000-4-3, 10 V/m, 80 MHz to 2.7 GHz, 80% AM at 1 kHz IEC60601-1-2, 4th Edition, Table 4
Electrical Fast Transients/Bursts	IEC61000-4-4, Level 4, ±4 kV, 100 kHz rep rate, 40 A, Criteria A, IEC60601-1-2, 4th Edition, Table 5
Surges Line to Line (DM) and Line to Ground (CM)	IEC61000-4-5, Level 3, ±1 kV DM, ±2 kV CM, Criteria A, IEC60601-1-2, 4th Edition
Conducted Disturbances Induced by RF Fields	IEC61000-4-6, 3 V/m – Level 4, 0.15 MHz to 80 MHz; and 12 V/m in ISM and amateur radio bands between 0.15 MHz and 80 MHz, 80% AM at 1 kHz IEC60601-1-2, 4th Edition, Table 5
Rated Power Frequency Magnetic Fields Test	IEC1000-4-8, Level 4: 30 A/m, 50 Hz/60 Hz IEC60601-1-2, 4th Edition, Table 4
Voltage Dips	IEC/EN61000-4-11: --100% dip for 10 ms, at 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°, criteria A --100% dip for 20 ms, 0°, criteria B (criteria A at 60% output load) --100% dip for 5000 ms (250/300 cycles), criteria B --60% dip for 100 ms, criteria B --30% dip for 500 ms, criteria B IEC60601-1-2, 4th Edition, Table 5

Notes:

Performance criteria are based on EN55024. According to the standards, performance criteria are decoded as following:

A. Normal performance during and after the test

B. Temporary degradation, self-recoverable

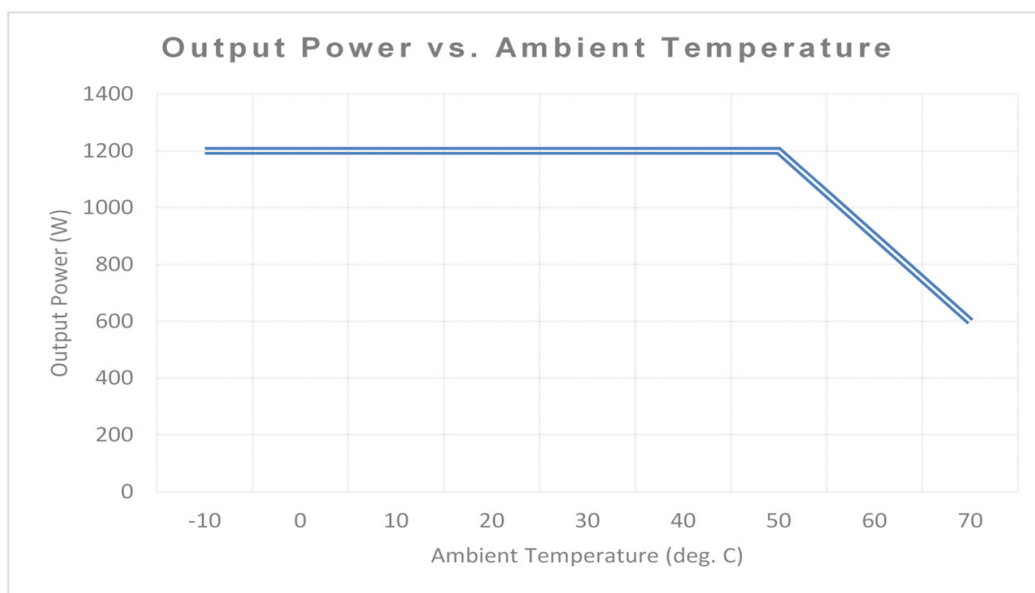
C. Temporary degradation, operator intervention required to recover the operation

ORDERING INFORMATION

Model Number ¹	Output Voltage	Output Current	Output Power	Auxiliary (standby) Output	Terminations
NCF1200S12K	12 V	100.0 A	1200 W	5V @ 2A	Screw Terminals
NCF1200S24K	24 V	50.0 A	1200 W	5V @ 2A	
NCF1200S48K	48 V	25.0 A	1200 W	5V @ 2A	

Note 1: Contact Advanced Energy for 15 V output models.

DERATING SPECIFICATIONS



SYSTEM TIMING SPECIFICATIONS

T1	Turn-on time - main output	500 to 1000 ms, measured at 115 VAC and 100% load
T2	Turn-on time - 5Vsb output	<100 ms
T3	Rise time	<100 ms, from 10% to main output in regulation, measured at 90 VAC and both 0% & 100% load
T4	Hold up time - main output	12V Output: >18 ms, from loss of AC to main output stays within regulation, measured at 80% load 24V & 48V Outputs: >20 ms, from loss of AC to main output stays within regulation, measured at 80% load
T5	Hold up time - 5Vsb output	>100 ms, from loss of AC to 5Vsb stays within regulation

PIN ASSIGNMENTS

Type	Connector	Pin #	Assignment	Mating Connector
INPUT	J1	1	Line	Molex: 19141-0052/0053
		2	Neutral	
		3	Ground	
OUTPUT	J201	1	+Vout	Molex: 19141-0058/0063/0065/0059/0064/0066
	J200	2	+Vout	
	J203	3	-Vout	
	J204	4	-Vout	
	J900	1	Return	LANDWIN: 2050S1400 (housing) LANDWIN: 2053T021N (pins)
		2	+Remote Sense	
		3	CONTROL	
		4	Return	
		5	Spare	
		6	Spare	
		7	Spare	
		8	POWER_GOOD	
		9	Spare	
		10	Spare	
		11	Return	
		12	Spare	
		13	5VSB	
		14	5VSB	

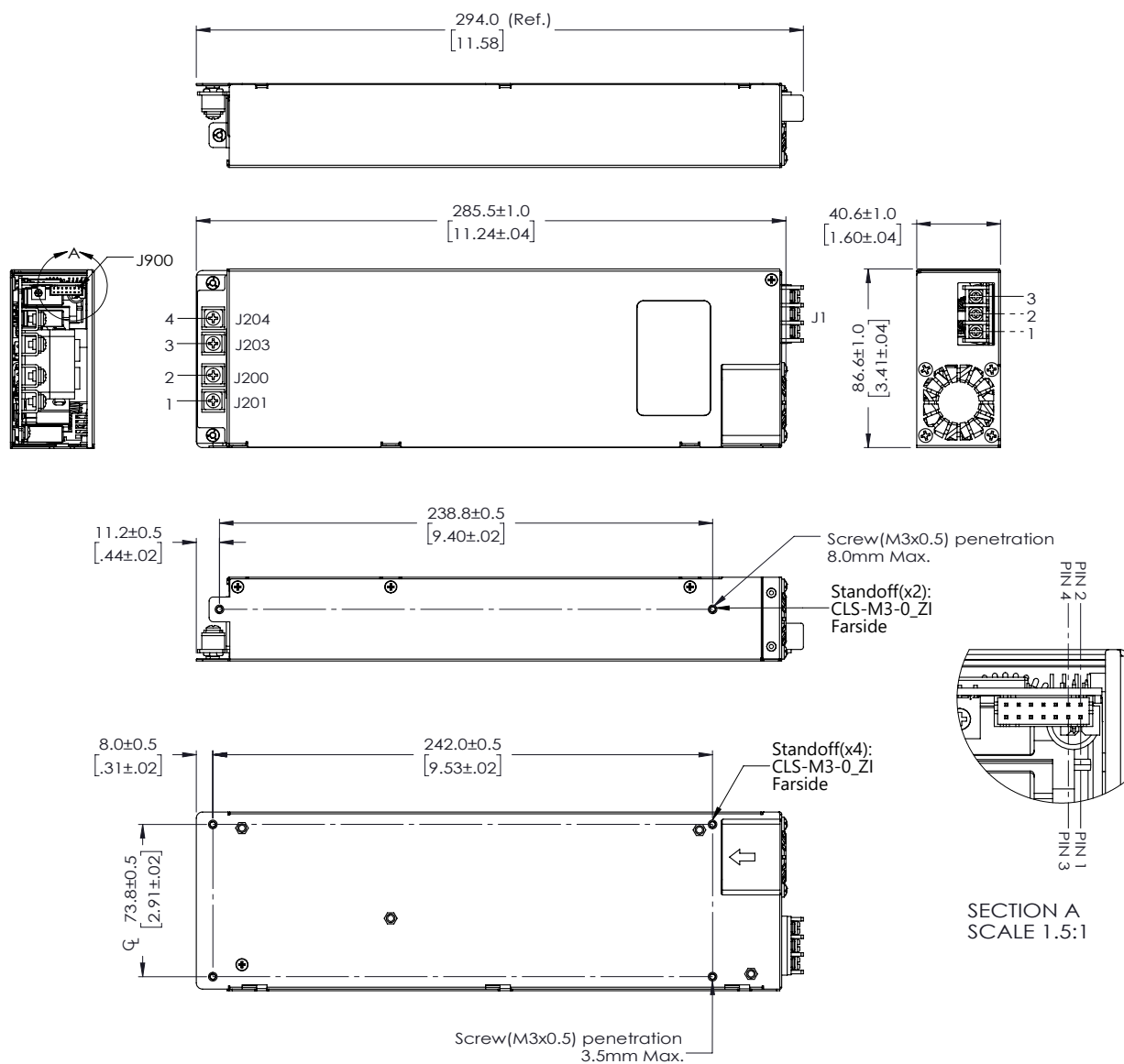
UNIT PACKAGING REQUIREMENTS

Inserted Instructions	Instruction sheet to be provided with all units packaged in individual unit box if used.
Individual Unit Packing	Units can be packed in egg crate type cartons for production quantities. Individual product shipments include an individual unit box.
Master Carton Shipping Box	4 units per master carton. Unit packaged into carton must be protected such that it will sustain 1.4 m drop test onto hard surface. Only anti-static packing material may be used inside the box. Exterior box sealing tape is anti-static type.
Individual Carton Packing Box (when used)	Individual carton is labelled with RoHS sticker and individual label showing unit serial number, bar code, manufacturing date, bar code, and manufacturing part number, bar code, country of origin.

SAFETY

USA	AAMI ES60601-1:2005, AAMI ES60601-1:2005/AMD1:2012, AAMI ES60601-1:2005/AMD2:2021	Complies with CF rated application requirements. See Leakage Current and Isolation parts for details.
Canada	CAN/CSA-C22.2 No. 60601-1:14/AM2:2022	
CB	IEC60601-1:2005/AMD2:2020	
CE	EN60601-1:2006+A1:2013+A12:2014+A2:2021	

MECHANICAL DRAWING



Notes:

All dimensions in mm (inches).



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ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than four decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE | TRUST

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