

# ARTESYN CONFIGURABLE NeoPower

Up to 4000 Watts



NP08

Advanced Energy's NeoPower (NP) configurable AC-DC power supplies provide high power density as either a programmable voltage or current source. The NeoPower configurable will feature an intuitive software interface and user configurable modules to enable fast prototypes. Modules can be connected in series and parallel with the configurable buss bar system to enable 1,000's of output combinations.

The NeoPower is certified for both industrial and medical safety approvals, including compliance to the SEMI F47 standard. The NeoPower supports digital communication with MODBUS RTU for control, monitoring and configuration.

## SPECIAL FEATURES

- Short circuit protection
- Over voltage protection (OVP)
- Over current protection (OCP)
- Over temperature protection (OTP)
- Active power factor correction
- Output on/off control
- Fan speed control
- Power good signal
- Active current share
- Remote voltage sense
- Supports MODBUS RTU digital communication. Supports PMBUS and CANOPEN with ConnectedPower dongle
- Input to output: 4000 VAC, 2 x MOPP  
Input to ground: 1500 VAC, 2 x MOOP  
Medical BF rated

- End user installable modules (no hi-pot or safety certifications required to install modules)
- 5-year manufacture's warranty

## SAFETY

- IEC/EN 62368-1
- UL 62368-1, CSA C22.2 No. 62368-1
- IEC/EN 60601-1
- ANSI/AAMI ES 60601-1  
CAN/CSA-C22.2 No 60601-1
- CE mark (LVD+RoHS)
- CB certificates and report
- CCC (CQC optional)

## AT A GLANCE

### Total Power

Up to 4000 W

### Input Voltage

90 to 264 VAC  
1-Phase

### # of Outputs

Up to 8



## ELECTRICAL SPECIFICATIONS

Input	
Case Model	NP08W1A
Number of Slots	8
AC Input Range	Low line 1-phase: 90 to 132 VAC; High line 1-phase: 180 to 264 VAC
AC Input Frequency	47 to 440 Hz
Turn-on Voltage	85.0 to 89.9 VAC
Turn-off Voltage	80.0 to 79.9 VAC
Max Power	Low line: 2000 W; High line: 4000 W
Max Inrush Current <sup>1</sup>	40 A
Max Input Current	TBD
Crest Factor	1.1 to 1.5
Power Factor	0.99 @ full load and nominal line
Harmonic Distortion	Meets EN 61000-3-2
Line Interruption	Meets SEMI F47-0706, 53, 58, S14 at nominal input voltages
Input Leakage Current <sup>2</sup> - Industrial	< 2.5 mA
Input Leakage Current <sup>2</sup> - Medical BF	Earth (normal condition) < 0.5 mA Earth (single fault condition) < 1.0 mA Touch/Patient (normal condition) < 0.1 mA Touch/Patient (single fault condition) < 0.5 mA
Hold-up Time	20 ms minimum, additional holdover storage with optional HUP module
Ride-through Time	20 ms minimum, additional holdover storage with optional HUP module
Input Protection	Internal fuse on all input lines (not user serviceable)
Input Over Voltage Protection	Up to 115% of nominal input without damage
Isolation	Input to output: 4000 VAC, 2 x MOPP Input to ground: 1500 VAC, 1x MOOP
Efficiency <sup>3</sup>	90% typical (Contact support for efficiency curve for a configured model)
Standby Output	5 V/2 A

Note 1 - Any additional inrush current surges or spikes in the form of AC cycle or multiple AC cycles greater than 10 ms, and less than 150 ms, must not exceed 25 A peak. Short pulses (<300 μS) caused by X caps are not considered.

Note 2 - The specification is not applicable for 400 Hz (+/-10%) input frequency operation.

Note 3 - Tested with 1-phase NP08W1A case. 5 V standby at no load.

## ELECTRICAL SPECIFICATIONS

1 Slot Single Output Modules					
Model	1S 0005M	1S 0012M	1S 0015M	1S 0024M	1S 0048M
Voltage Source (VS) Mode					
Nominal Output Voltage	5 V	12 V	15 V	24 V	48 V
Output Voltage Range	0.5 to 6 V	1.2 to 14.4 V	1.5 to 18 V	2.4 to 28.8 V	4.8 to 57.6 V
Output Current Range	0 to 56 A	0 to 41.6 A	0 to 33.3 A	0 to 20.8 A	0 to 10.4 A
Current Source (CS) Mode					
Nominal Output Current	56 A	33.3 A	26.6 A	16.6 A	8.3 A
Output Current Range	2.24 to 56 A	1.66 to 41.6 A	1.33 to 33.3 A	0.83 to 20.8 A	0.42 to 10.4 A
Minimum Output Voltage	0.5 V	1.2 V	1.5 V	2.4 V	4.8 V
Max Output Power	280 W	400 W	400 W	400 W	400 W
Max Capacitance for Dynamic Loading	820 $\mu$ F	470 $\mu$ F	220 $\mu$ F	220 $\mu$ F	220 $\mu$ F
Module Connected in Parallel	Up to 16 modules with active current sharing rate +/-10% of $I_{nom}$ .				
Remote Sense	All outputs have remote sense capability. Compensate for 500 mV of voltage drop.				
Under-voltage Protection (UVP)	Capable of detected an under-voltage condition in which the output voltage does not achieve its setpoint voltage.				
Over-voltage Protection (OVP)	110% to 135% of $V_{out}$ , latch off mode. Cleared by input voltage reset or clear faults digital register.				
Over-current Protection (OCP)	Latch vs foldback				
Short Circuit Protection (SCP)	All outputs protected from continuous output shorted condition (no damage or reliability issues).				

## ELECTRICAL SPECIFICATIONS

Output - Adjustable Voltage Source	via Digital Command	via Analog Signal
Programming Accuracy	+/- 0.5% of Vset or Vnom, whichever is greater	+/- 1% of Vset or Vnom, whichever is greater
Monitoring Accuracy	+/- (0.5% of Vset + 0.5% of Vnom)	+/- (1% of Vset + 1% of Vnom)
Line Regulation	+/-0.5% of Vnom	
Load Regulation	+/-0.5% of Vnom	
Ripple & Noise @ 20 MHz BW (Pk-to-Pk)	1% of Vset or Vnom, whichever is greater Measured with a 0.1 $\mu$ F ceramic capacitor in parallel with a 10 $\mu$ F tantalum or low ESR E-cap.	
Ripple & Noise @ 20 MHz BW (RMS)	0.1% of Vset or Vnom or 10 mV, whichever is greater Measured with a 0.1 $\mu$ F ceramic capacitor in parallel with a 10 $\mu$ F tantalum or low ESR E-cap.	
Common Mode Ripple/Noise @ 10 Hz to 70 MHz BW	0.1% of Vset or Vnom or 10 mV, whichever is greater Across a 100 Ohm resistor between both DC outputs, including ground, at the DC power connector and chassis ground. Use FET probe such as Tektronix model P6046 or equivalent.	
Transient Loading	Minimum dynamic load: 10% of rated output current Maximum dynamic loading step: 60% step load & 1 A/ $\mu$ S slew rate Voltage deviation: +/- 7.5% of Vnom (5V output models), +/- 5% of Vnom (other output models) Recovery time @ 60% step load: 1ms at recovery value of 0.5% of Vnom	
Turn-on Output Voltage Overshoot	+7.5% of Vset or Vnom, whichever is greater (5V output models) +5% of Vset or Vnom, whichever is greater (other output models)	
Turn-off Output Voltage Undershoot	-7.5% of Vset or Vnom, whichever is greater (5V output models) -5% of Vset or Vnom, whichever is greater (other output models)	
Adjustable Output Rise/Fall Time	20 to 100ms	

Output - Adjustable Current Source	via Digital Command	via Analog Signal
Programming Accuracy	+/- 1% of Iset or Irated, whichever is greater	+/- 2% of Iset or Irated, whichever is greater
Monitoring Accuracy	+/- (1% of Iset + 1% of Irated)	+/- (0.5% of Iset + 0.5% of Irated)
Line Regulation	1% of Irated	
Load Regulation	1% of Irated	
Ripple & Noise @ 20 MHz BW (RMS)	1% of Iset or Irated, whichever is greater Measured with a 0.1 $\mu$ F ceramic capacitor in parallel with a 10 $\mu$ F tantalum or low ESR E-cap.	
Turn-on Output Voltage Overshoot	+5% of Iset or Irated, whichever is greater	
Turn-off Output Voltage Undershoot	-5% of Iset or Irated, whichever is greater	
Adjustable Output Rise/Fall Time	20 to 100ms	

## ENVIRONMENTAL SPECIFICATIONS

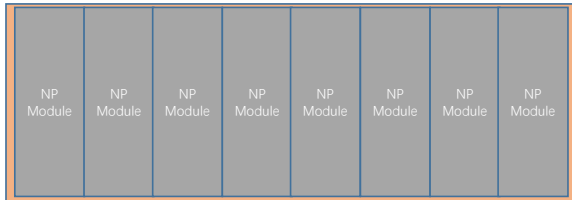
Operating Temperature	-40°C to +70°C ambient. Derate 2.5% per degree over 50°C to +70°C. -20°C startup Reverse airflow models: -40°C to +40°C ambient
Storage Temperature	-40°C to +85°C
Operating Humidity	20% to 90% non condensing
Storage Humidity	10% to 95% non condensing
Operating Altitude	Up to 3,000 meters above sea level
Storage Altitude	Up to 9,144 meters above sea level
Vibration	Operating Sinusoidal Vibration MIL-STD-810G, method 514.6, procedure I, category 4-11: 10 to 2000 Hz 6.0 Grms 30 mins three axis (Non Operating ); 10 to 500 Hz 4.22 Grms 30 mins three axis (operating); 1G 5 to 500 Hz sine vib 1 oct/min (Sine Vib) Operating Random Vibration: IPC-9592B Class 1 Non-Operating Vibration (Packaged): IPC-9592B Class 1; MIL-STD-810G, Method 514.6, Procedure 1, Category 7, Table 514.6C-VII General Exposure
Shock	MIL-STD-810G, method 516.6, Procedure I and II: 30 Grms 26ms square wave pulse (non operating) 40 Grms 6ms half sine pulse (operating)
Shipping and Handling	NSTA for <100 lbs; MIL-STD-2073-1 >100 lbs
Cooling and Audible Noise	<65 dBA with 80% load @ 30°C at nominal input voltage with Smart Fan algorithm to be optimized based on module and case thermal sensors. When modules are inhibited via software control, the fan speed is reduced to minimum and acoustic noise is <46 dBA. With modules off via front panel switch fans will cycle between minimum speed for 1 min, and off for 9 mins < 80 dBA continuous for 24 hours
Ingress Protection	Fan Cooled, IP20
MTBF	Calculated: 200,000 hours, Telcordia specifications @ 25°C ambient at full load, nominal input line AC Demonstrated: > 500,000 hours
Pollution Degree	2, with optional conformal coating
RoHS Compliance	Yes

ENVIRONMENTAL SPECIFICATIONS

Case Code	Module Options Codes	Case Option Codes	Software Code	Communication Bus	Modification Code
<b>NPXYZ</b>	<b>XYZO</b>	<b>XYZ</b>	<b>A</b>	<b>0</b>	<b>XXX</b>
<p><b>XX = Number of Slots for Case Size</b> 08 = 8 Slots</p> <p><b>Y = Input Voltage Range</b> W = Wide range 90 to 264 VAC</p> <p><b>Z = Input Phase</b> 1 = Single phase</p>	<p>First - # of Slots Second - Type Third - Voltage Code Forth - Option Code</p> <p><b>X = Number of Slots for Module</b> 1 = 1 slot, single O/P 2 = 2 slot, single O/P 3 = 3 slot, single O/P 4 = 4 slot, single O/P</p> <p><b>Y = Module Type</b> M = Medical</p> <p><b>Z = Voltage Code</b> See Output voltage table</p> <p><b>O = Option Codes:</b> 0 = Standard 1 = Module enable Z = Option defined in MOD-I</p>	<p>First - Parallel Code Second - Case Options Third - Configuration</p> <p><b>X = Parallel Codes</b> See Parallel Codes table Z = See MOD-I</p> <p><b>Y = Case Options</b> 0 = No options 1 = Reverse air 3 = Global enable 4 = Fan idle with inhibit Z = See MOD-I</p> <p><b>Z = Configuration Code</b> None = Shipped from AEI cases/modules C = AEI factory configured/tested</p>	<p>A = Standard B = Non standard voltage Z = See MOD-I</p>	<p>0 = Standard MODBUS 1 = PMBUS 2 = CANBUS Z = See MOD-I</p>	<p>Advanced Energy assigned code to track modification made from the standard design CC = Conformal coating RG = Ruggedized</p>

Chassis Options

NP08



8 in.

## ORDERING INFORMATION

### Output Voltage Code Table

Voltage	Code	Voltage	Code	Voltage	Code	Voltage	Code
2 V	A	6 V	H	18 V	O	42 V	V
2.2 V	B	8 V	I	20 V	P	48 V	W
3 V	C	10 V	J	24 V	Q	54 V	X
3.3 V	D	11 V	K	28 V	R	60 V	Y
5 V	E	12 V	L	30 V	S	190 V	19
5.2 V	F	14 V	M	33 V	T	-	-
5.5 V	G	15 V	N	36 V	U	-	-

### Parallel Code Table

TBD

## ORDERING INFORMATION

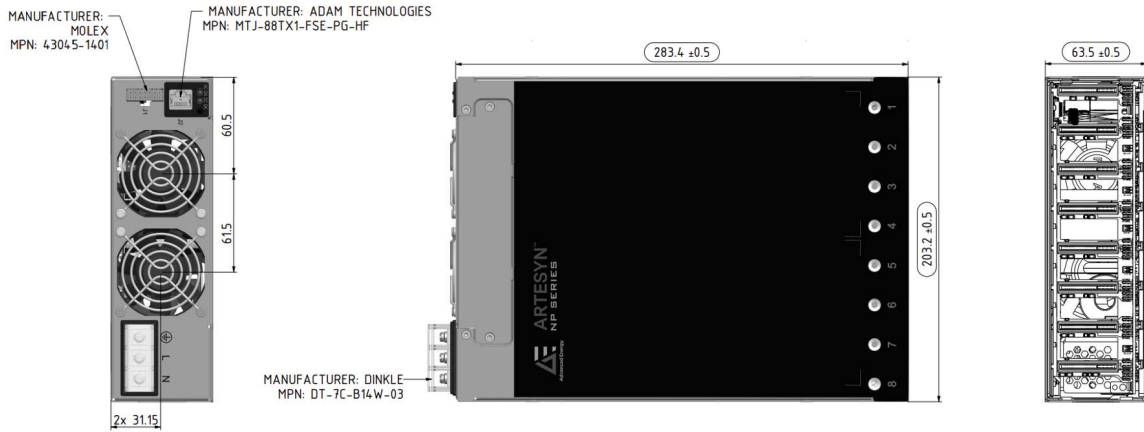
Case Model	Case Orderable Part Number	Description	Status
NP08W1A	83-108-0001W	4000W Case, 1-Phase	Released

Module Model	Module Orderable Part Number	Description	Status
1S 0005M	83-011-0005M	1 Slot 5V Medical, 280W	Released
1S 0012M	83-011-0012M	1 Slot 12V Medical, 400W	Released
1S 0015M	83-011-0015M	1 Slot 15V Medical, 400W	Released
1S 0024M	83-011-0024M	1 Slot 24V Medical, 400W	Released
1S 0048M	83-011-0048M	1 Slot 48V Medical, 400W	Released

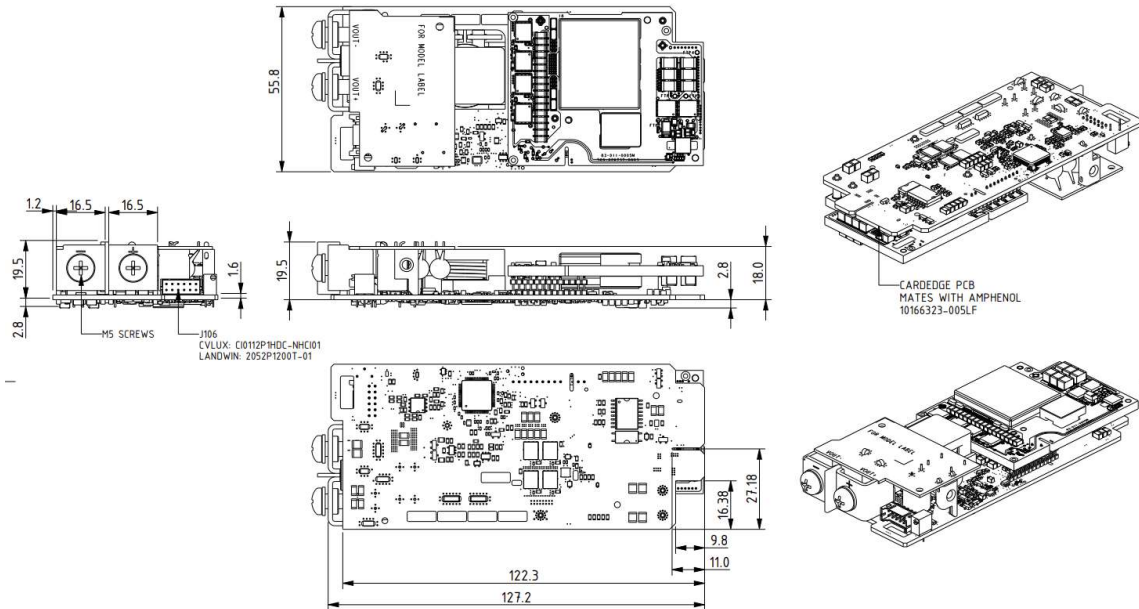


**MECHANICAL DRAWINGS**

**NP08W1A Case (Unit: mm)**  
 (Input, Signal Connector and LED Locations)



**1 Slot Single Output Modules (Unit: mm)**



CASE INTERFACE

NP08 Front Panel

(Input, Signal Connector and LED Locations)



Conditions	DC OK LED	AC OK LED
AC Present, Outputs Inhibited (Case Global Inhibit)	BLINKING	ON
AC Present, Outputs Inhibited (Module Isolated Inhibit)	OFF	ON
AC Present, Outputs Enabled	ON	ON
Output OCP/OVP/Fan Fault	OFF	ON
AC Not Present	OFF	OFF

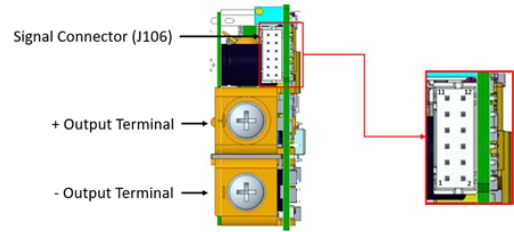
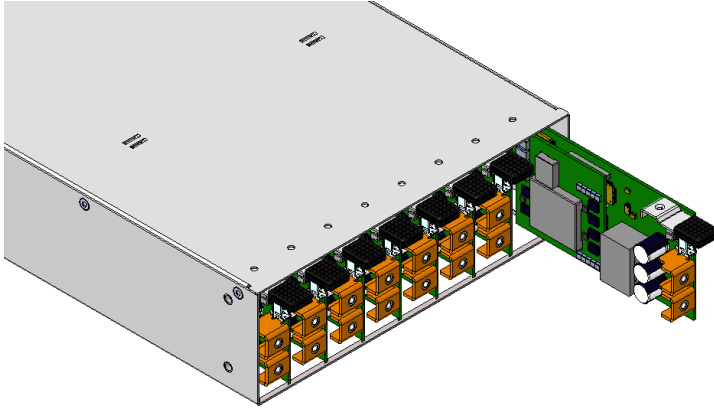
Case J1 Control & Signals Connector			
Pin #	Function	Pin #	Function
1	G_ACOK_E	8	G_ACOK_C
2	G_PGOOD_E	9	G_PGOOD_C
3	INH0/EN0	10	INH1/EN1
4	Spare	11	ISO_RTN1
5	5V_EXT	12	ISO_RTN1
6	5V_STBY	13	5V_STBY_RTN
7	Spare	14	Spare

Case J2 Connected Power Bus			
Pin #	Function	Pin #	Function
1	RS485 A	5	Spare
2	RS485 B	6	Spare
3	Spare	7	5 V Logic Supply
4	Spare	8	5 V Logic Supply Return

# MODULE INTERFACE

## NP08 Rear View

Output, Signal Connectors and LEDs



Module Conditions	LED
Module Inhibited	Blinking Green
Module Enabled	Solid Green
Module Faulted	Solid Amber

Module Signal Connector			
Pin #	Function	Pin #	Function
1	ISO_M_INHIBIT	7	VI_TRIM_EN#
2	ISO_M_INHIBIT_RTN	8	D_RTN
3	ISO_POWER_GOOD	9	ISHARE
4	ISO_POWER_GOOD_RTN	10	ISHARE_RTN
5	0-10 VI PROG	11	RS+
6	0-5 VI PROG	12	RS-



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## ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three 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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