

Medical Grade AC/DC Power Supply With PFC

85-264 Vrms Input Voltage	12/15/24/28/48 V Semi-Regulated Output	1100W Output Continuous	1300W Output Transient	Up to 93% Full Load Efficiency
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Features

- High efficiency, 93% for 48V_{OUT} at 1100 W
- Universal input voltage range
- Semi-regulated output for bus stability
- Integral fan cooling with speed control
- Active PFC; EN61000-3-2 compliant
- Low leakage; EN60601-1 compliant
- Low noise; EN55011 / EN55022 Class B compliant
- Over-current, over-voltage, & over-temp protection
- DC Power Good / AC Power Good signals
- Remote enable input
- Fan status output / Fan enable input
- Small size: 4.75" x 7" x 1.625" (encased)
- RoHS 6/6 compliant
- 5V (250mW) standby output

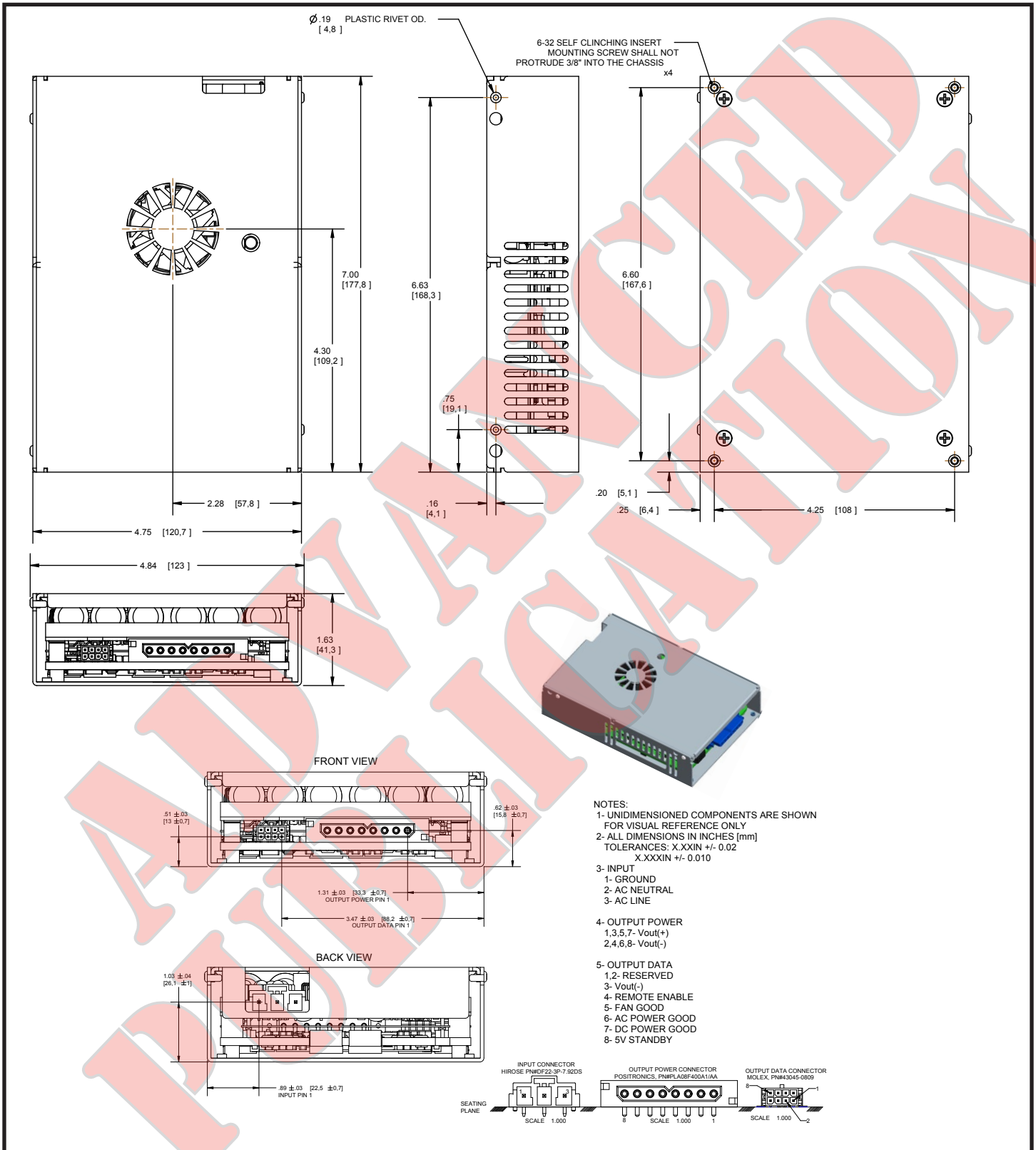
ACuQor 1100W Series ELECTRICAL CHARACTERISTICS

MAIN OUTPUT SPECIFICATIONS			GENERAL SPECIFICATIONS			
Output power (continuous) (5 s transient)	85-132/170-264 Vrms 85-132/170-264 Vrms 132-170 Vrms	1100 W 1300 W See Figure XX	Fundamental ripple freq.	Input Output	500 kHz 250 kHz	
Nominal DC output voltage (at 800W) (Semi-regulated)	12 Vout 15 Vout 24 Vout 28 Vout 48 Vout	12.4 V 15.6 V 25 V 29 V 50 V	Audible noise	Fan speed varies with temp.	TBD dBA @ 1 m max.	
Efficiency (see figs. Y - YY)	12 Vout, 115 Vrms, 1100 W 24 Vout, 115 Vrms, 1100 W 48 Vout, 115 Vrms, 1100 W 12 Vout, 230 Vrms, 1100 W 24 Vout, 230 Vrms, 1100 W 48 Vout, 230 Vrms, 1100 W	89% typ. 90% typ. 91% typ. 90.5% typ. 91.5% typ. 92.5% typ.	Weight (TBD)	() () ()	() () ()	
Hold-up time (to -20%)	12 / 15 Vout 24 / 28 / 48 Vout	16 ms @ 1100 W 20 ms @ 1100 W	MTBF	MIL-217 Demonstrated	TBD kHours TBD kHours	
Maximum load capacitance	12 Vout 15 Vout 24 Vout 28 Vout 48 Vout	48,000 µF 40,500 µF 24,000 µF 19,200 µF 6,000 µF	ISOLATION SPECIFICATIONS			
Output ripple voltage	Switching frequency (20 MHz BW) Twice line frequency (at 800W)	0.5% p-p 5.0% p-p	Isolation voltage	Input to output Input to ground Output to ground (BF & CF) Output to ground (CFD)	4000 Vrms 1500 Vrms 1500 Vrms 5000 Vpulse	
Turn-on delay	Iout steps from 50-75% At 0.2 A/µs	3% typ / 6% max. 100 ms recovery	Insulation resistance	Output to ground	10 MΩ min.	
Transient response	Cyclic restart	110-120%	Leakage currents		See Note 2	
Overvoltage protection	Cyclic operation	115% rated Iout	ENVIRONMENTAL CHARACTERISTICS			
Short circuit protection	Over line, load and temperature	±6.0%	Thermal performance	Operating ambient (see Figure X) Non-operating ambient	0 °C to +70 °C -40 °C to +85 °C	
Total regulation	Always on (See Note 1)	5 V @ 50 mA	Relative humidity	Non-condensing	5-95% RH	
Auxillary Output	Automatic recovery	+125 °C (PCB Temp)	Altitude	Operating Non-operating	10,000 ft max. 30,000 ft max.	
Thermal protection	Input Low Voltage Input High Voltage	0.45 V (max) 4.15 V (min)	Random vibration	5-500 Hz	0.03 g2/Hz	
REMOTE_ENABLE	INPUT SPECIFICATIONS			Shock	Half-sine, 10 ms, 3 axes	20 g peak
AC input voltage	Universal range	85-264 Vrms	EMC CHARACTERISTICS (preliminary)			
Input frequency		47-63 Hz	Conducted emissions	EN55011 and EN55022, FCC part15	Level B	
Input current	115 Vrms @ 1100 W 230 Vrms @ 1100 W	11 Arms 5.5 Arms	Line frequency harmonics	EN61000-3-2	Class A	
Power factor		>0.98	Voltage fluctuations	EN61000-3-3	Clause 5b	
Input surge current	264 Vrms (cold start)	50 A max.	ESD air	EN61000-4-2	Level 3	
Internal input fuses	Both AC lines	20 A	ESD contact	EN61000-4-2	Level 3	
			Radiated immunity	EN61000-4-3	Level 3	
			Fast transients	EN61000-4-4	Level 3	
			Line surge immunity	EN61000-4-5	Level 3	
			Conducted immunity	EN61000-4-6	Level 3	
			Power freq. mag. field	EN61000-4-8	3 A/m	
			Voltage dip immunity	EN61000-4-11	Perf Criteria A, A, B <5% UT 10 ms, 70% UT 500 ms, 40% UT 100 ms	
			SAFETY AGENCY CERTIFICATIONS (pending)			
			All certification marks appear on individual unit labels.			
			UL60950-1:2003			
			CAN/CSA-22.2 No. 60950-1:2003			
			EN 60950-1:2001			
			CE Marked			
			Meets NFPA 99 2005 300 µA earth leakage			

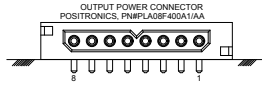
NOTES:

- Derate 1 mA per °C above 50 °C ambient temperature.
- Leakage currents see page TBD.

MECHANICAL DRAWINGS



CONNECTOR DETAILS



OUTPUT DATA CONNECTOR PINOUT

Pin 1	Reserved	Reserved for future use.
Pin 2	Reserved	Reserved for future use.
Pin 3	VOUT(-)	Negative Output Voltage.
Pin 4	REMOTE_ENABLE	Logic input. See Figure C. Pull high to enable main output.
Pin 5	FAN_GOOD	Open collector with internal 5V pullup. See Figure A. Pulsed low on fan failure, 100ms, 50% duty. Short to VOUT(-) to disable fan.
Pin 6	AC_POWER_GOOD	Open collector with internal 5V pullup. See Figure B. Pulled low on AC power dropout.
Pin 7	DC_POWER_GOOD	Open collector with internal 5V pullup. See Figure B. Pulled low during startup ramp and within 5 °C of temperature shutdown threshold.
Pin 8	5V_STANDBY	5 V @ 50 mA available whenever AC power is applied.

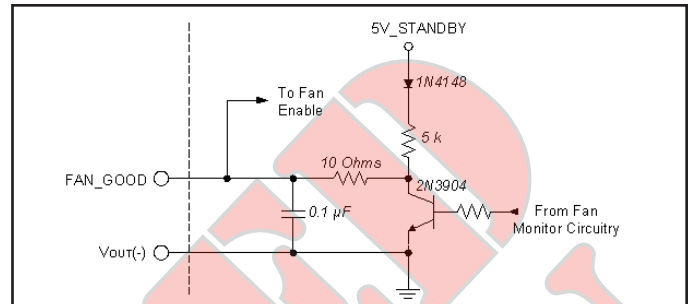


Figure A: Fan status output / Fan enable input interface circuitry.

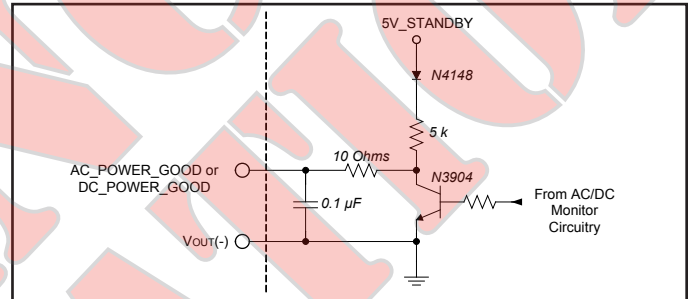
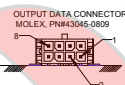


Figure B: Power good interface circuitry.



OUTPUT POWER CONNECTOR PINOUT

Pin 1	VOUT(+)	Positive Output Voltage.
Pin 2	VOUT(-)	Negative Output Voltage.
Pin 3	VOUT(+)	Positive Output Voltage.
Pin 4	VOUT(-)	Negative Output Voltage.
Pin 5	VOUT(+)	Positive Output Voltage.
Pin 6	VOUT(-)	Negative Output Voltage.
Pin 7	VOUT(+)	Positive Output Voltage.
Pin 8	VOUT(-)	Negative Output Voltage.

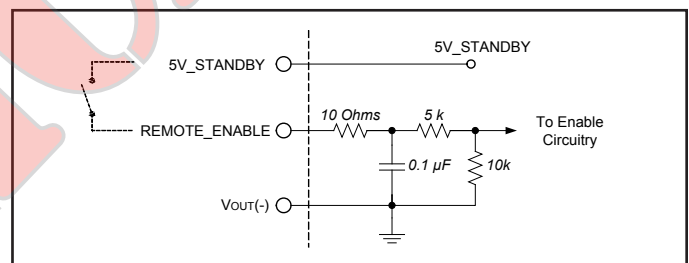


Figure C: Remote enable interface circuitry.



INPUT CONNECTOR PINOUT

Pin 1	Ground
Pin 3	AC Neutral
Pin 5	AC Line

MATING CONNECTORS

Connector	Type	Contact
OUTPUT (Power)	Positronic PLA08M7	Positronic MS112N
OUTPUT (Data)	Molex 43025-0800	Molex 43030-0008
INPUT	Hirose DF22B-3S-7.92C	Hirose DF22A-1012SC

PART NUMBERING SYSTEM

The part numbering system for SynQor's ACuQor AC/DC power supplies follows the format shown in the table below. Not all combinations make valid part numbers, please contact SynQor for availability.

Family	Output Power	Grade	Range	Output Voltage	Package Type	Thermal Design	Options
AQ ACuQor series of ac-dc semi-regulated output power supplies	0800: 800W 1100: 1100W 1400: 1400W	M: (medical) I: (industrial)	U: Universal (85-264 VRMS)	12: 12V 15: 15V 24: 24V 28: 28V 48: 48V	G: 1 unit (5"x7")	C: Encased	Medical Grade B: B isolation rating BF: BF isolation rating CF: CF isolation rating CFD: CF isolation rating defibrillator proof IND: Industrial grade

Example: AQ1100MU48GCBF

ACCESSORIES

SynQor offers a series of assemblies that can be ordered according to the table below. Mechanical drawings for these accessories are available for download in pdf format from the SynQor website.

Part Number	Description
AQ-CBL-INPUT1CG	Input mating cable with pre-stripped wire ends (36" long)
AQ-CBL-OUT1CDG	Output mating cables (Signal and Power) with pre-stripped wire ends (18" long)

APPLICATION NOTES

A variety of application notes and technical white papers can be downloaded in pdf format from the SynQor website.

[Online Application Notes](#)

[Online Library of Technical White Papers](#)

[SynQor website.](#)

PATENTS

SynQor holds the following U.S. patents, one or more of which apply to each product listed in this brochure. Additional patent applications may be pending or filed in the future.

5,999,417	6,222,742	6,545,890	6,577,109	6,594,159
6,731,520	6,894,468	6,896,526	6,927,987	7,050,309
7,072,190	7,085,146	7,119,524	7,269,034	7,272,021
7,272,023	7,558,083	7,564,702		

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Warranty

SynQor offers a two (2) year limited warranty. Complete warranty information is listed on our website or is available upon request from SynQor.

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