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USER MANUAL

CCHP-6000-XX

6kJ/s Capacitor Charging Power Supply



Your distributor:



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Professional Power Supplies

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1. Description of CCHP-6000 Power Supply

The CCHP-6000 power supply is designed to deliver up to 6000 Watts of fixed current into a pulse forming network capacitor load. The output is available in models ranging from 400VDC to 6.0kVDC the unit is also factory configured for input voltages between 200-240VAC or 380-480VAC. An optional output of +24V@ 3A is also available for auxiliary power.

CCHP Block Diagram

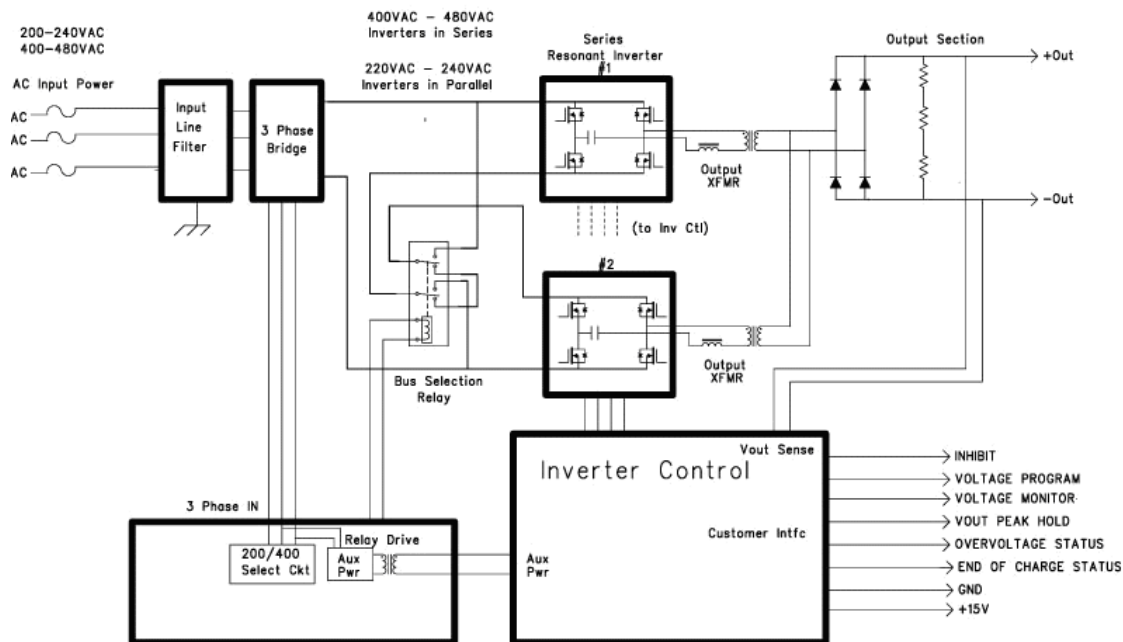


Figure 1, CCHP-6000 Block Diagram

2.Explanation of Symbols



Hazard: This equipment produces high voltages, which can be fatal. Only service personnel of Lumina Power, Inc. are qualified to service this equipment.



High Voltage Present. This power supply produces lethal high voltages. Only service personnel of Lumina Power, Inc., are qualified to service this equipment. Only qualified service personnel are permitted to install this power supply.

3.CCHP-6000 Specifications

CCHP-6000-XX model numbering XX indicates output voltage with
P for positive and N for negative.

Input

Voltage	200 - 240 VAC or 380 - 480 VAC, 3 phase, factory configured. Input voltage must be identified upon ordering.
Current	23.5A per phase at 200 VAC and 11.6A per phase at 380 VAC.
Frequency	47 - 64Hz.

Output

Power:	6000 J/s charge rate factory configured
Output Voltage	Fixed voltage between the ranges of 400VDC – 6.0kVDC (factory configured)
Polarity	Positive or Negative (factory configured)
Efficiency	>80% at full output
Regulation:	0.5% @100Hz
Aux. Output	+24VDC @ 3A (optional feature)

Interface

Connector	15 Pin “D” Sub Female
Voltage Program	0-10V for 0-Max Voltage
Voltage Monitor	0-10V for 0-Max Voltage
Inhibit/Reset	Input
End of Charge	Indication
Overvoltage	Indication
Ready	Active low (optional feature)
+15V Aux Power	

Environment

Operating Temp	0 to 40 °C
Storage	-20 to 85 °C
Humidity	0 to 90% non-condensing
Cooling	Forced air
Altitude and Pressure	2000 meters maximum, 80 to 103 kPa

Dimensions

Outline	Please see Figure 3, CCHP-6000 Mechanical Outline Drawing 17.3 inch length, 16.6 inch wide, 3.7 inch high 43.9 cm length, 42.2 cm wide, 9.4 cm high (does not include mounting flanges or electrical terminals)
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4.CCHP-6000 Interface

CCHP-6000-XX INTERFACE 15 Pin "D" Sub Connector Female (Refer to Figure 2, CCHP-6000 Interface Diagram)

STANDARD 15 PIN INTERFACE

Pin #	Pin Name	Functional Level	Description
1	Inhibit/Fault Reset (input)	Low = RUN, <0.3V High = OFF, +5V to +15V	This pin is the basic ON/OFF control pin for the power supply. Grounding pin 1 enables power supply operation if all faults are clear. Applying +15V to pin 1 prevents the inverter from operating.
2, 4, 10	No connect		
3	Overtemp Warning (output)	High = safe operation, +15V Low = Hot warning, <0.5V	Open collector output rated 30V, 100mA. Collector is tied internally to 5kohm pull-up resistor. Indicates unsafe internal heat sink temperatures. When the thermal switch reaches 75 ± 3 °C internal heat sink temperature this output is pulled to ground. This signal is an advisory indication only and will not turn off power supply. This is a warning signal for the customer to shut down the system. Unit will continue to operate until independent thermal switch measures a critical temperature on internal heat sinks which shuts down the unit.
5	Voltage Program (input)	0 – 10V = 0 – Vout _{max}	Output is programmed externally with a 0 to +10V signal = 0 to Voutmax.
6	Overvoltage Status Indicator (output)	High = OK, +15V Low= Overvoltage or no load, <0.5V	Open collector output rated 30V, 100mA. Collector is tied internally to 5kohm pull-up resistor. If the load becomes open circuited, the power supply will detect the fault and shut down instantaneously pulling pin 6 low, protecting the power supply and other equipment from over voltages. The AC power must be cycled OFF and ON to reset.
7	Vout Peak Hold (output)	0 – 10V = 0 – Vout _{max}	Monitors output voltage with a peak hold circuit. The time constant of the peak hold circuit is approximately 5 seconds. 0 to +10V = 0 to Voutmax.
8	Vout Monitor (output)	0 – 10V = 0 – Vout _{max}	Monitors output voltage. 0 to +10V = 0 to Voutmax.
9, 11, 12	+15V @0.1A (output)	+15V \pm 10%	+15VDC for customer interface, maximum output current is 100mA.
13	End of Charge Status Indicator (output)	High = Charging, +15V Low= Load charged to Voltage Program, <0.5V	Open collector output rated 30V, 100mA. Collector is tied internally to 5kohm pull-up resistor. When the load capacitor reaches the programmed voltage, pin 13 is pulled low. Pin 13 will oscillate from high to low as the power supply replaces charge that is bled through the feedback network.
14, 15	Ground (output)		Ground return for control interface signals.

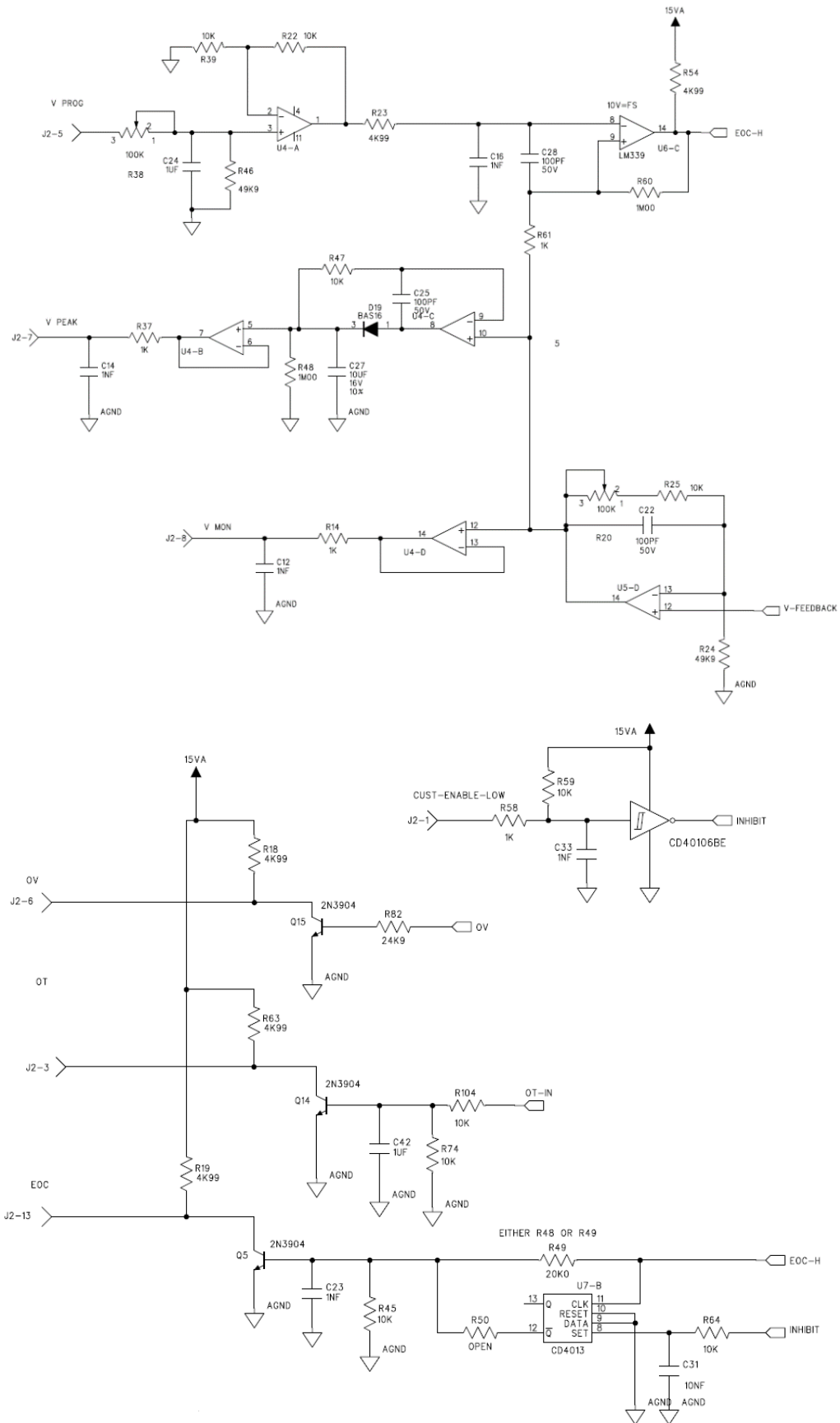


Figure 2, CCHP-6000 Interface Schematic

5. Warnings



Warning:

Equipment is not suitable for use in presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.



Warning:

These power supplies are not provided with any isolation devices and shall only be used inside other equipment that has means to isolate its circuits electrically from the supply mains on all poles simultaneously.

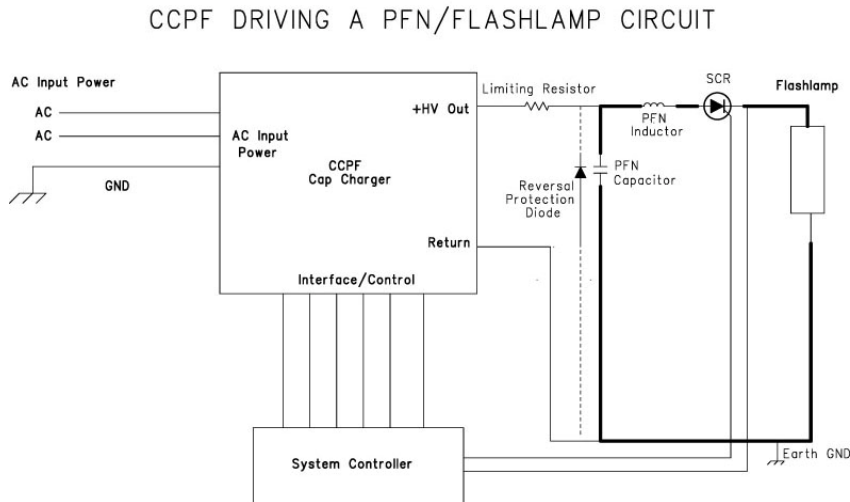


Warning:

To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth

6. Typical Applications

6.1 Using a CCPF with a pulse forming network (PFN)

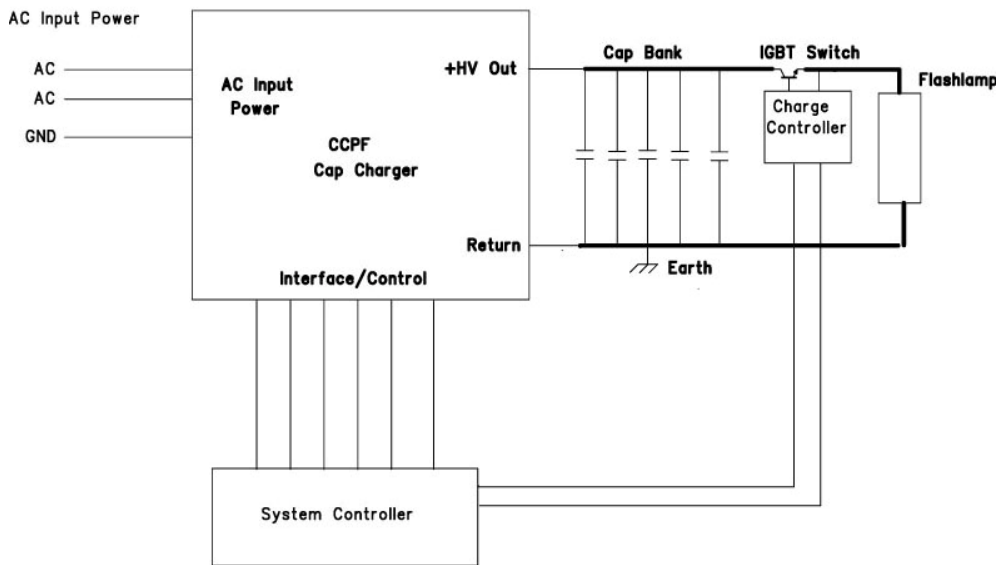


The above block diagram shows a typical connection between a CCPF capacitor charging power supply and a well matched pulse forming network. In a typical operation, when the CCPF is ENABLED via Pin 1, the INHIBIT function, the CCPF will charge up the PFN capacitor to the programmed value and then transmit an END OF CHARGE signal to the user. Before discharging the load capacitor into the PFN, the CCPF should be disabled via the INHIBIT function. Once the PFN is completely discharged and the SCR has completely extinguished, the charging function can be ENABLED via the INHIBIT function and the CCPF will charge the capacitor again to the programmed value. PFN designers may opt to include a limiting resistor and a reversal protection diode to protect the power supply if there is an arc in the PFN circuitry.

NOTE: In PFN applications, the power supply should be INHIBITED via Pin 1 before the capacitor is discharged into the load. Noise from the discharge could cause improper operation if the power supply is not INHIBITED.

6.2 Using a CCPF with a square wave network (Reservoir Charging)

Square Wave Lamp Driver



In this application, the power supply is **ENABLED** via the **INHIBIT** function and charges up the capacitor bank to the programmed voltage. The IGBT will deliver short, high current pulses to the flashlamp. The power supply is not **INHIBITED** during this process and continuously tops the capacitor bank.

7.Installation

These power supplies are designed for and intended only for installation into OEM pulse forming systems.

- Only qualified technicians or qualified assemblers may install these power supplies.
- Only qualified Lumina Power personnel may service these power supplies.
- There are no user serviceable parts in this equipment.
- **Required wire and connectors:** Refer to Figure 3 on next page for the locations of connections. Table 2, CCHP Connections below shows required cables and connectors:

Table 2, CCHP Connections

Connection	Description	Required Wire and Connectors
AC Input Power	4 Position terminal strip	At least 12AWG wire
Interface	15 pin “D” female	15 pin “D” male
HV Output	MHV Female, *See note below	MHV Male and coax cable rated for at least 150% of maximum rated output voltage of unit
24V Aux Output	2 Pin Tyco Mate-N-Lok Connector.	Tyco 35077-1 2 Pos Plug (Digikey P/N A14279-ND) Tyco 350550-1 Contacts (Digikey P/N A1441-ND)

*** Note: flying lead configuration also available.**

- **Ventilation:** This unit is forced air cooled via internal DC fans. A clearance of 2” should be maintained at either side of the power supply the fan end of the power supply as well as the grill side of the power supply. Hot air exits the grill side and should be ducted out of the system. Fully sealed systems should implement some type of heat exchanger system to maintain the environmental conditions outlined on page two of this document.

IMPORTANT APPLICATION NOTE REGARDING AC INPUT POWER

AC Input wires should be at least #12 AWG,
rated for at least 600V and 105 Degree C.

IMPORTANT SYSTEM NOTE ON AC INPUT POWER

CCHP-6000 units are fused on all 3 phases X, Y, and Z.

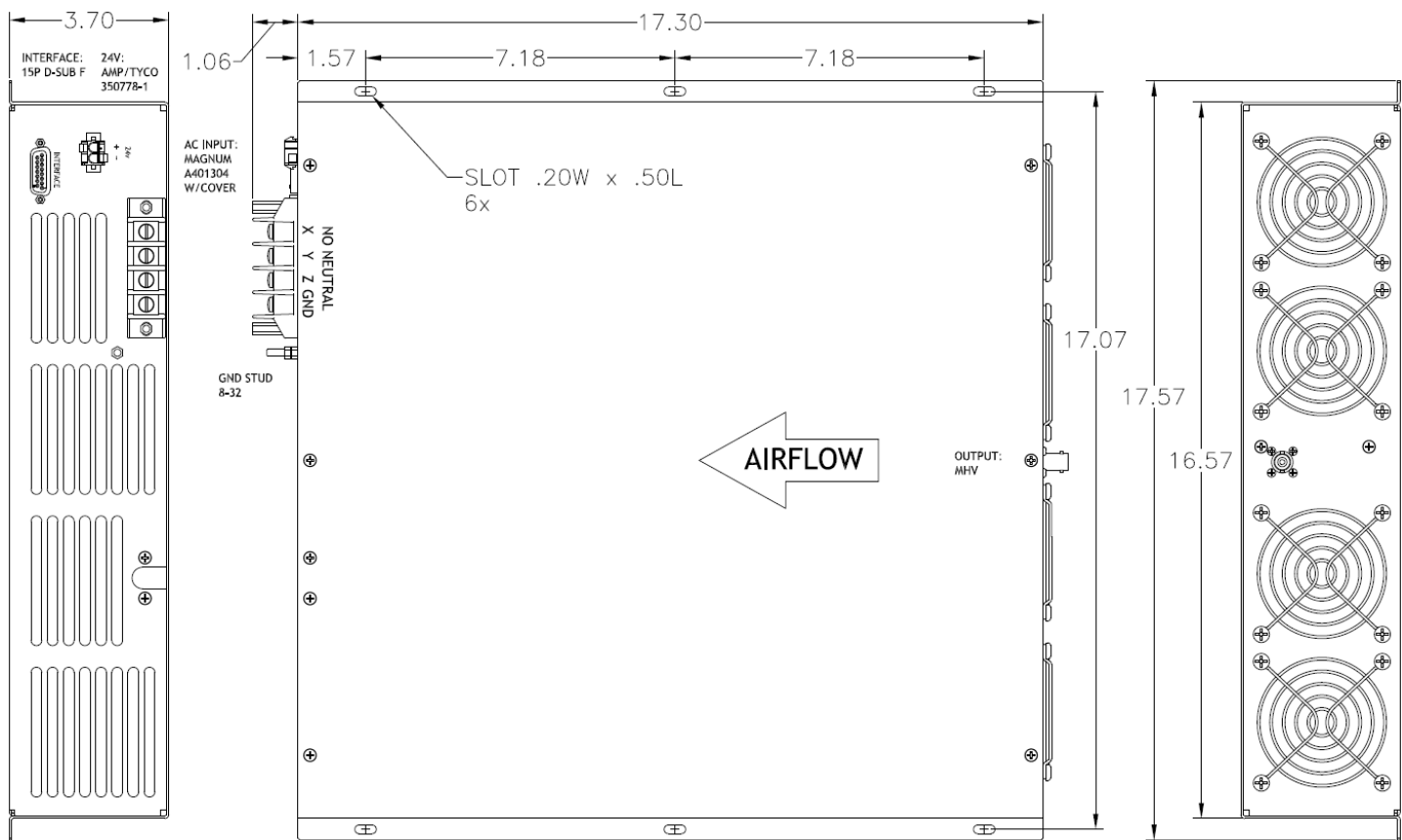


Figure 3, CCHP-6000 Mechanical Outline Drawing

8. Product Limited Warranty

Lumina Power, Inc., as Seller, warrants that each Product sold by it is free of defects in materials and workmanship. Duration of warranty is as follows:

- a. All Chassis enclosed products are covered for twenty four (24) months from date of shipment. Products included but are not limited to the following product families: CCHP, CCHP, CCHPHC, LDY, LDYHC, LDQCW, XLB (excluding XLB-300), MLB, CCPF, and CCHP. Custom fully enclosed products may be covered for the same 24 months. Please consult factory for specific terms.
- b. All Open Frame products are covered for 12 months from date of shipment. Open frame power supplies are defined as any product that is not enclosed in a metal or plastic enclosure. Products included but are not limited to the following product families: LDPC, LDQPC, XLB-300, and any open frame custom products.
- c. All products returned for repair are covered for a period of 6 month or the balance of the original warranty, whichever is longer.

Warranty is not transferable to parties outside of original Buyer's corporate or educational organization. Seller will have sole discretion in making determination of validity of warranty if the Product is transferred to a different user group than the original Buyer.

Normal wear and tear and items expendable in normal use are not covered by this warranty. All warranty repair or replacement of parts shall be limited to Product malfunctions, which, in the sole opinion of Seller, are due or traceable to defects in original materials or workmanship. Such determination will be made when the Product is returned to the Seller's factory, transportation prepaid by the Buyer, within the warranty period.

All obligations under this warranty shall cease immediately in the event of abuse, accident, alteration, misuse, or neglect of the Product. Use and service of the Product in a manner not in accordance with the Owner's Manual (if furnished) will likewise cause all obligations under this warranty to cease. Repaired or replacement parts are warranted only for the remaining unexpired portion of the original warranty period for the Product. After expiration of the applicable warranty period, Buyer shall be charged at the then current prices for parts, labor, and transportation.

Seller has no responsibility under this warranty for the cost of any work (material, labor, and/or other expenses) performed by or incurred by Buyer or any third party for modification or repair of the Product unless specifically authorized in advance in writing by Seller.

Reasonable care must be used to avoid hazards. Seller expressly disclaims responsibility for loss or damage caused by use of its Products other than in accordance with proper operation procedures. Other than, those expressly stated herein, there are no other warranties of any kind, expressed or implied, and specifically included but not by way of limitation are the implied warranties of fitness or merchantability for a particular purpose.

It is understood and agreed the seller's liability whether in contract, in tort, under any warranty, in negligence or otherwise shall not exceed the return of the amount of the purchase price paid by the purchaser and under no circumstance shall seller be liable for special, indirect, incidental, or consequential damages. The price stated for the product is a consideration in limiting seller's liability. No action, regardless of form, arising out of the transactions of this agreement may be brought by purchaser more than one year after the cause of action has accrued.

Seller's maximum liability shall not exceed and buyer's remedy is limited to either (i) repair or replacement of the defective part of product, or at seller's option (ii) return of the product and refund of the purchase price, and such remedy shall be the buyer's entire and exclusive remedy.

9.Service

This unit contains no user serviceable parts. Service and repair should be performed only by qualified personnel from Lumina Power, Inc. For more information contact

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Rev	ECO	Description	Doc Ctrl	Date	App
1	7706	Initial Release	MJ	07/24/2017	EK
2	7830	Update AC input selection and outline	MJ	05/02/2019	EK