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CCPF-500 OPERATION MANUAL

Lumina P/N 02001136

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1. Description of CCPF-500

The CCPF-500-XX is a capacitor charging power supply designed for OEM laser manufacturers. The power supply provides up to 500J/sec charging power for a capacitor-flashlamp system. The main power output provides a constant current to charge up a capacitor to the programmed value.

The CCPF-500-XX can be configured for maximum output voltages up to 2000V. XX is the model designation which indicates the maximum output voltage. As an example, a CCPF-500 configured for 1000V maximum output voltage is designated as a CCPF-500-1P, where the P indicates a positive output. Positive output is the standard polarity.

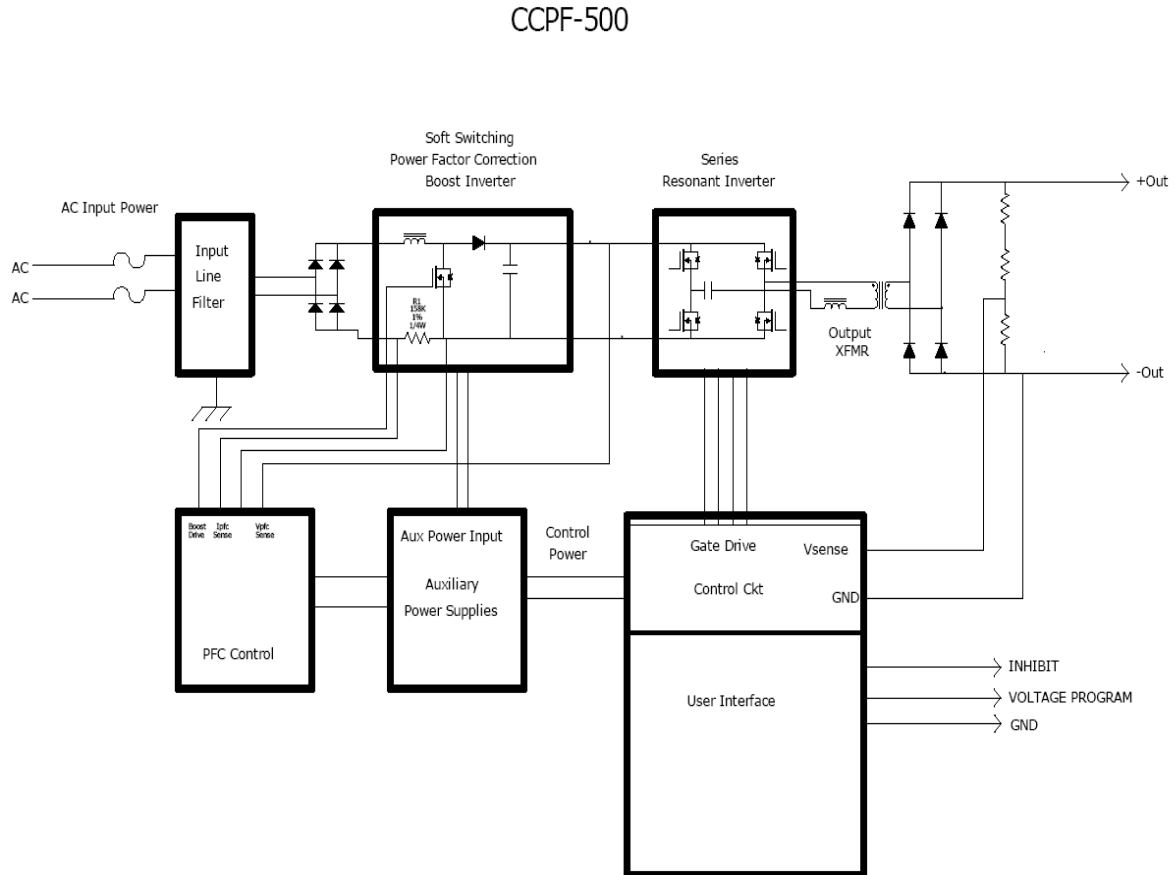


Figure 1.1 CCPF-500 Block Diagram

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 personnel of Hoya Conbio are permitted to install this power supply.

3. Specifications

CCPF-500-XX Specifications

XX = .2P to 2P (Units can be configured for $V_{out_{max}}$ from 200V to 2000V)

Input

Voltage: 100 – 240 VAC
Current: 5.5A @115VAC, 2.8A @220VAC

Output

Power: 500J/sec
Output Voltage: Configurable from 200V to 2kV.
Output Current: $2 * P_{out_{max}}/V_{out_{max}}$
Polarity: Positive or Negative
Efficiency: >75% at full output
Regulation: 0.5% @100Hz

Interface

Connector: 15 Pin “D”, (4 Pin Molex interface optional)
Voltage Program: 0-10V for 0- $V_{out_{max}}$
Voltage Monitor 0-10V for 0- $V_{out_{max}}$
Inhibit

Environment

Operating Temp: 0 to 40 °C
Storage: -20 to 85 °C
Humidity: 0 to 90% non-condensing
Cooling: Forced air

Dimensions
6” x 9” x 3.7”
15.24cm x 22.9cm x 9.4cm

Regulatory
Leakage Current: <250uA
Isolation: 4000VAC/5700VDC
Safety: Approved to EN60601.1 (In process)

4. Interface Information

STANDARD 15 PIN INTERFACE

<u>PIN #</u>	<u>TITLE/DESCRIPTION</u>
1	ENABLE/RESET- (Input) 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. <i>(opposite option available)</i> 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.
5	VOLTAGE PROGRAM- (Input) Output is programmed externally with a 0 to +10V signal for 0 to $V_{out_{max}}$.
7	V_{out} Peak Monitor - (Output) 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 $V_{out_{max}}$.
8	V_{out} MONITOR- (Output) Monitors output voltage. 0 to +10V for 0 to $V_{out_{max}}$.
9	+15V (Output) Maximum output current is 200mA.
13	END OF CHARGE STATUS INDICATOR- (Output) Open collector output rated 30V, 100mA. Collector is tied internally to 4.02kohm 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.
4, 14, 15	GND

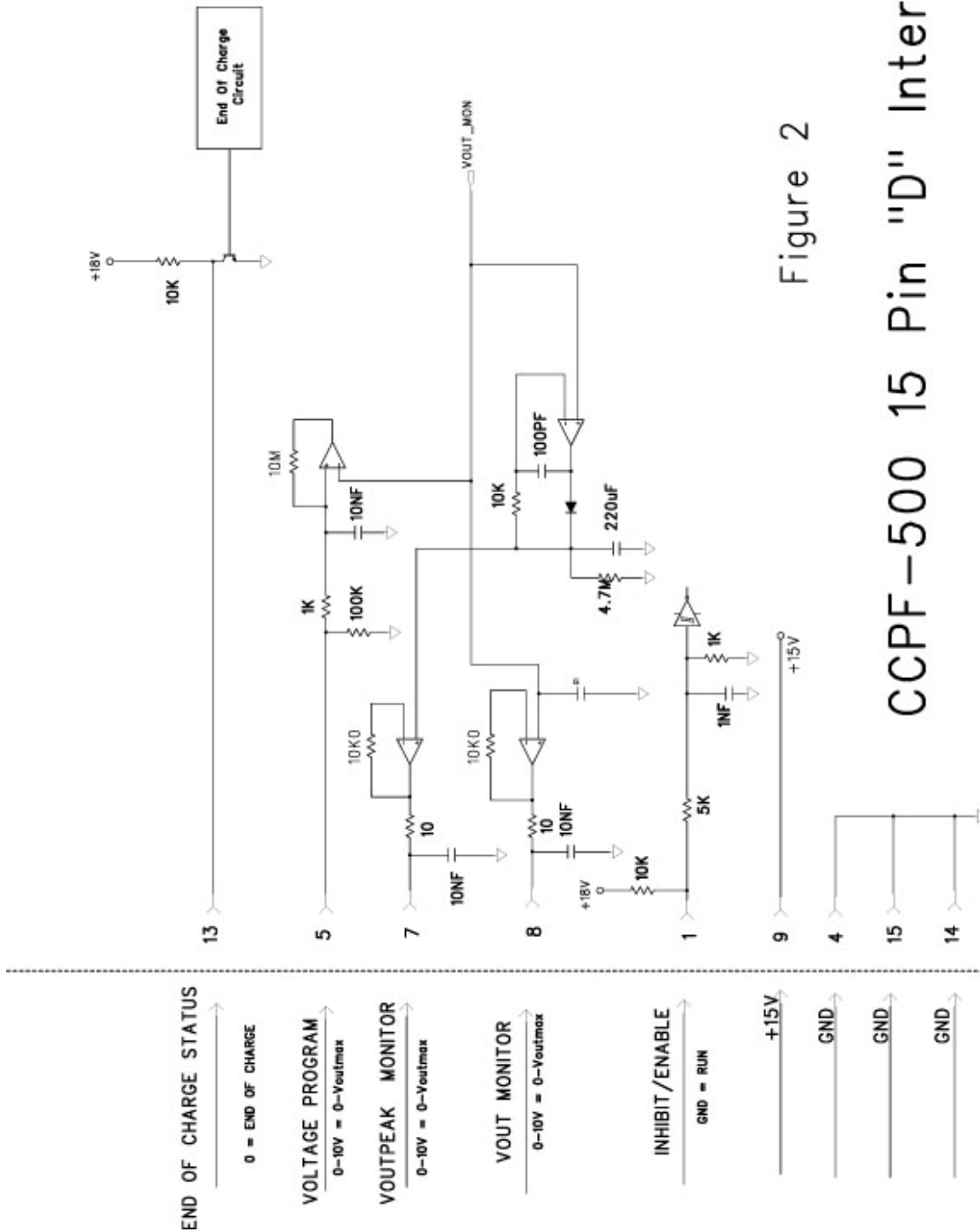


Figure 4.1 CCPF-500 15 Pin Interface

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 medical equipment that has means to isolated its circuits electrically from the supply mains on all poles simultaneously.



Warning:

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

6. Installation

6.1 These power supplies are designed for and intended only for installation into laser systems using PFN – flashlamp circuitry:

- Only qualified technicians or qualified assemblers may install these power supplies into their lasers.
- 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 the Figure 6.1 below for the locations of connections. Table 6-1 below shows required cables and connectors:

Connection	Description	Required Wire and Connectors
AC Input Power	2 Position Phoenix Connector DMKDS2.5	At least 14AWG wire
AC Earth	10-32 GND stud	At least 14AWG wire
Interface	15 pin “D” female	15 pin “D” male
HV Output	MHV Female Amphenol 27000	MHV Male and coax cable rated for at least 150% of maximum rated output voltage of unit

Table 6-1 CCPF-500-XX Connections

AC Input Power (100 – 240 VAC, 50/60Hz)	
Phoenix Connector DMKDS2.5	
PIN #	PIN DESCRIPTION
1	LINE
2	LINE
Earth Stud should be used as Earth GND	

Table 6.2 CCPF-500 Input Power Connections

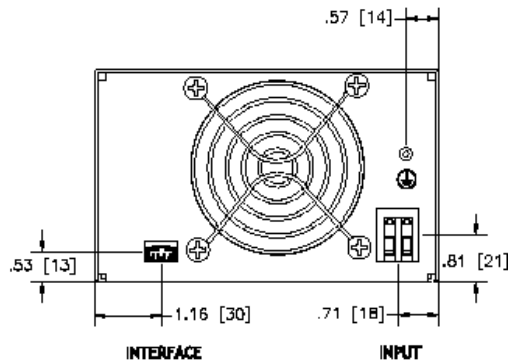


Figure 6.1 Input Side of CCPF-500

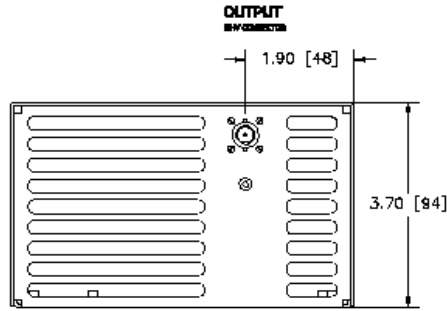


Figure 6.2 Output Side of CCPF-500

Note: Output connector is MHV Bulkhead Amphenol 27000

7. Typical Applications

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

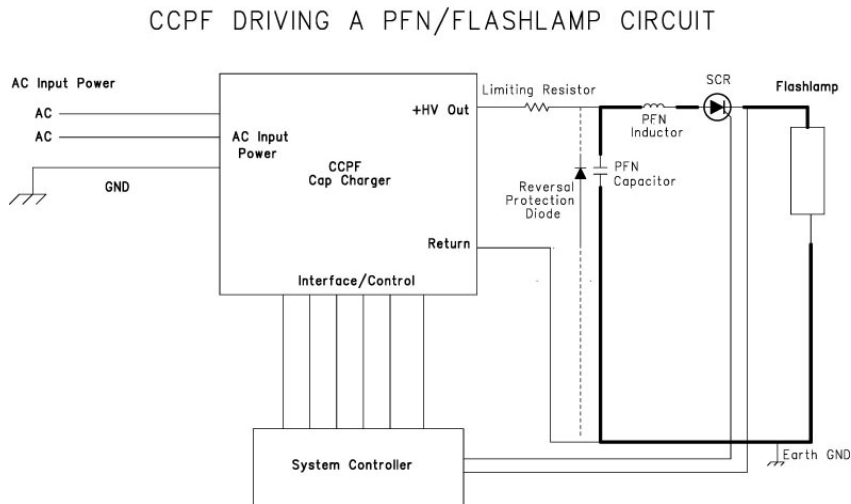


Figure 7.1 Typical PFN Circuit

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 via pin 13 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. The optional limiting resistor and reversal protection diode are shown and should be included in any PFN circuit where arcing is possible.

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

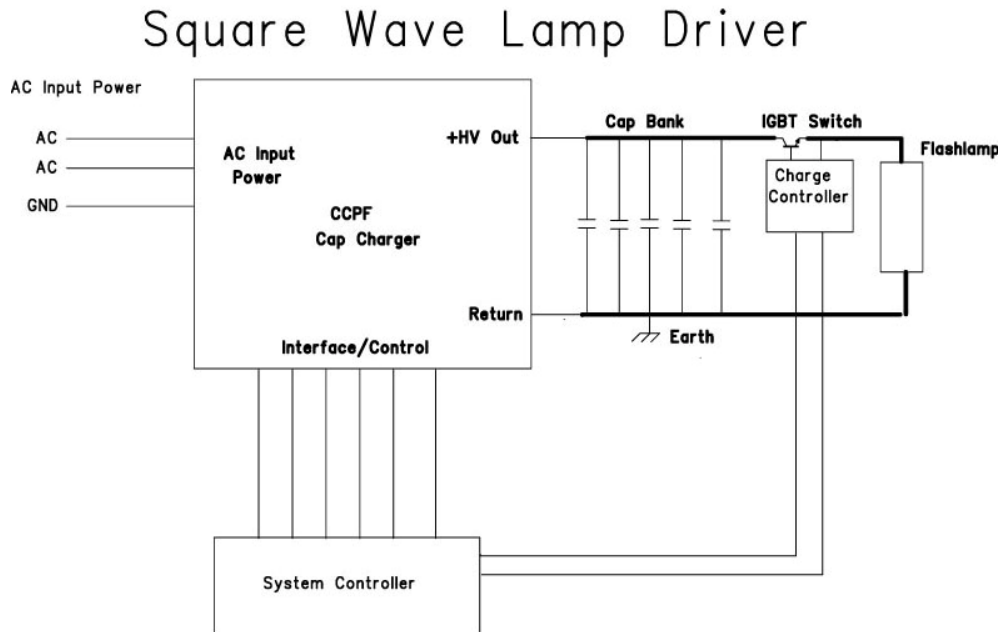


Figure 7.2 Typical Square Wave Pulse Circuit

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.

8. 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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ECO	Description	Doc Ctrl	Date	Approved
	Initial Release	M J		BO'B