

HPP-6000 Laser Diode Pulser



The HPP-6000 laser diode pulser is a new concept in pulsed diode driver development. Designed to be used with the LDD series drivers as the power source, the HPP pulser can deliver up to 1000 amps of output current with full protection of the laser diode. Pulse widths of $\geq 50\mu\text{s}$ to CW can be achieved with rise/fall times of $< 15\mu\text{s}$. and repetition rates to 5kHz. A CW simmer current of up to 12 amps is available.

Control of the HPP pulser via the standard 15 pin analog/TTL interface includes inputs for enable, trigger, output current, simmer voltage and CW/pulsed operation. The output is fully protected against open and short circuits along with overtemp.

The HPP pulser enhances Lumina Power's complete line of laser diode driver products from 10 watts to 6000 watts.

ADVANTAGES

- Pulsed current to 1000 amps
- 6kW average output power
- Compliance Voltage: 10 to 150V
- $\leq 15\mu\text{s}$. Rise/Fall time
- Advanced diode protection
- CW simmer mode available
- $> 90\%$ Efficiency
- Continuously modulate current, pulse width and frequency



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HPP-6000 Laser Diode Pulsar

Specifications:

INPUT

Voltage: 12 to 150VDC (see page 4)
Power Source: Modified LDD-series laser diode driver (HP or VP Option)

OUTPUT

Power: $\leq 6000\text{W}$ Average Power
Pulse widths: $\sim 50\mu\text{s}$ to CW
Output Voltage: 10 to 150 Volts.
Output Current: 1000 amps maximum
Efficiency: $>90\%$ at full output
Regulation: 0.5% @100Hz
Rise Time: $<15\mu\text{s}$ (Voltage/Current dependant)

INTERFACE

Connector: 15 Pin "D" Sub Female
Voltage Program: 0-10V for 0-Max Voltage
Voltage/current Monitors: 0-10V for 0-Max Voltage
Pulse Input: TTL
Temperature Fault: TTL
Option Simmer: 12 amps max

ENVIRONMENT

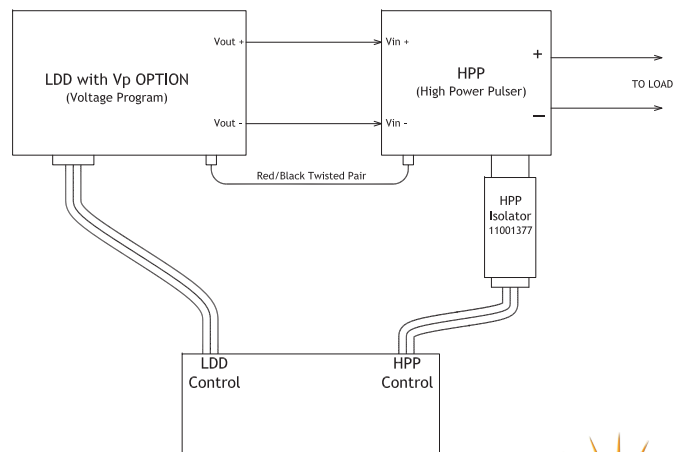
Operating Temp: 0 to 40°C
Storage: -20 to 85°C
Humidity: 0 to 90% non-condensing
Cooling: Forced air

Output Cable: 36" (91cm) Custom low inductance flatstrip cable

DIMENSION: 13.8" x 9.27" x 3.93" (35 x 23.5 x 10cm)

NOTE: The HPP-6000 pulser is designed to be powered by a modified LDD series CW laser diode driver. Consult factory for exact LDD/HPP combinations for your application.

Due to the potential for ground loops between the LDD and HPP-6000 interfaces an isolator is required. Use Lumina Power supply Isolator part number 11001377. See block diagram on page 5.



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HPP Interface or Isolator

Pin #	Pin Name	Function/voltage, Level	Description
1	Pulse Control (input)	TTL High = On TTL Low = Off Default = Off	Pulse the output of the HPP by applying a TTL signal to Pulse Control, pin 1.
2,3	Ground		Interface Return
4	Temp Monitor	TTL High = Fault	Internal heatsink temp switch, setpoint 75°C
5	I out Monitor (output)	0-10V = 0 - Ioutmax	The output current of the supply can be monitored by Iout Monitor. Real time measurement.
6	I Program (input)	0-10V = 0 - Ioutmax	The power supply output current is set by applying a 0-10V analog signal to Iprogram(+).
7	Poor Load Match	TTL High = Fault	When the voltage compliance of the diode laser load is not between 75% to 100% of the specified voltage compliance, the output is disabled and this fault is transmitted. This fault may be reset three times. If the fault persists after three resets, the unit will disable the output until input voltage is removed and applied again. Note: this pin is only active when the output current is more than 50 %
8	Auto Voltage Adjust Return	Internal Function	Floating Return for Pin 13
10	CW/Pulsed Mode	TTL High = CW	Switch between CW & Pulsed operation
11	+15V (output)		Auxiliary +15 Volts, 200mA to Isolator Input
12	Ready Signal	5 to 15V= Ready	Power Supply is ready
13	Auto Voltage Adjust	Internal Function	Automatically adjusts the output voltage of the LDD power supply for optimal efficiency if load voltage varies.
14	Enable	High = RUN = +5V to +15V Low = OFF = 0V Default= Off	The Enable function turns the output section of the power supply ON and OFF. When the power supply is enabled, Pin 1 pulse control is operational and current is delivered to load as programmed via Iprogram(+)
15	Interlock	Open = OFF Connect to GND = RUN	The Interlock function can be connected to external interlock switches such as a door or overtemp switches. Voltage must be less than 3 V.

Note:

1. Pin 9 = Simmer (bias) current control if this option is ordered. 0 to 10V = 0 to 10amps.

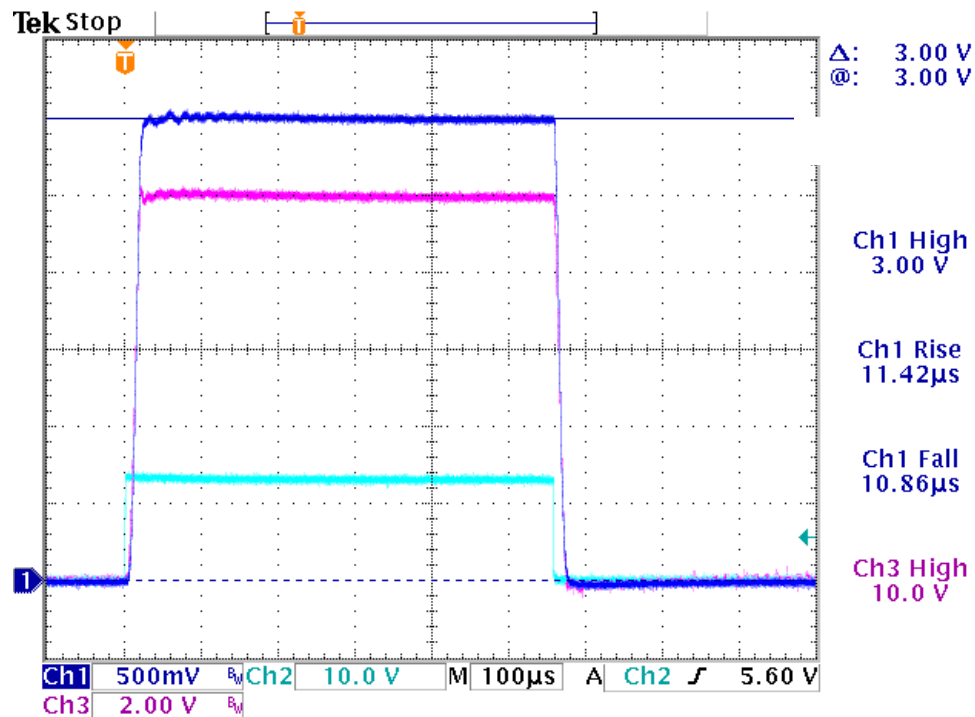
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Pulse Characteristics & Input Voltage Requirements

The scope trace below is an example of the waveforms that can be achieved with the HPP Pulser. This is a 300 amp, 45V pulse. The rise time is 11.42 μ s and the fall time is 10.86 μ s with virtually no overshoot on the leading edge of the waveform.

The unique topology of the HPP pulser allows for a wide range of pulse widths from ~50 μ s through CW without any droop or rolloff near the falling edge of the pulse.

The relationship between the output voltage of the LDD power supply and the load voltage of the HPP Pulser must be set for the proper amount of overhead. For optimal waveforms and maximum efficiency the input voltage of the HPP Pulser must be 2 to 3 volts higher than the output voltage. Conversely, input voltages that are 8 volts above the output voltage will shutdown the HPP Pulser.



Channel 1. Current
 2. Pulse
 3. I monitor

Note: The LDD or LDN series CW power supplies are ideal current sources for the HPP Pulser. These power supplies interact with the Pulser for the optimal overhead voltage and maximum efficiency. Other options are available, Consult sales@luminapower.com.

Outline Drawings

