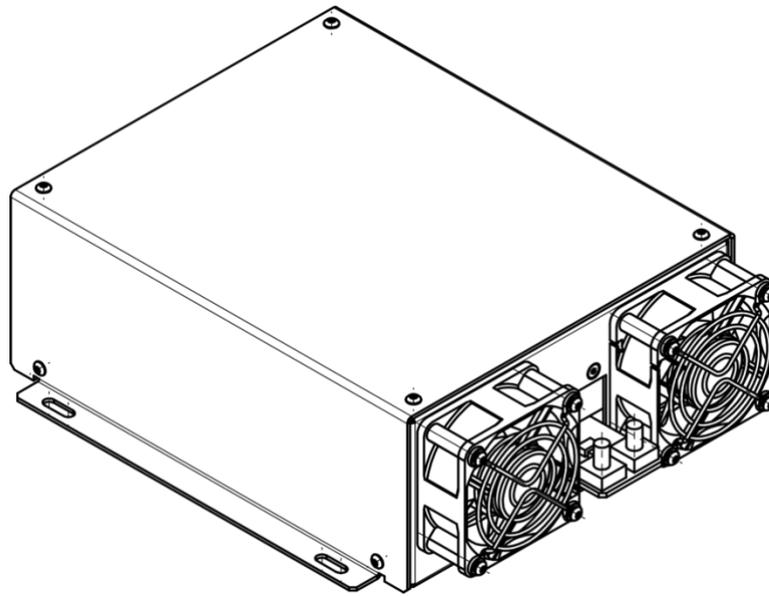


PDD-1000 pulsed diode driver

User manual



Warning! This equipment may be dangerous.
Please read user manual before starting operations.

Important note. Please measure output with adequate load only (diodes). Resistive load connected to the output won't destroy the driver, but will severe distort its behaviour.

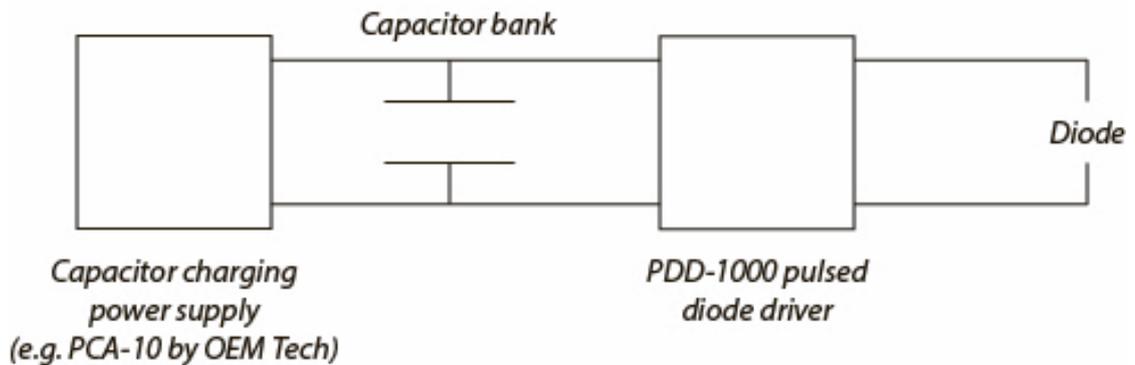


Overview / Applications

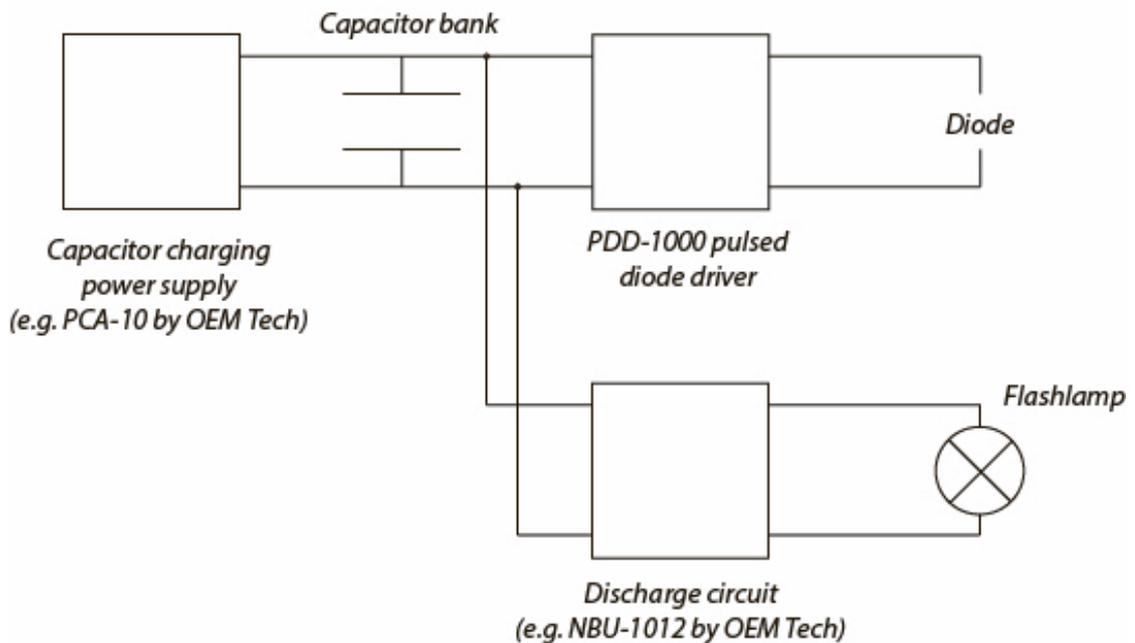
PDD-1000 is a series of high-power pulsed diode drivers. Peak output power is up to 10kW (with user selectable I_{MAX} and V_{MAX}), averaged output power is up to 1000W.

Driver was specially designed for direct diode hair removal application. As a result the input voltage is DC (supposing the driver is powered from the buffer capacitor battery included in system). Such the composition also allows to have both flashlamp and diode applicators in the same hair removal system simultaneously.

Diode only



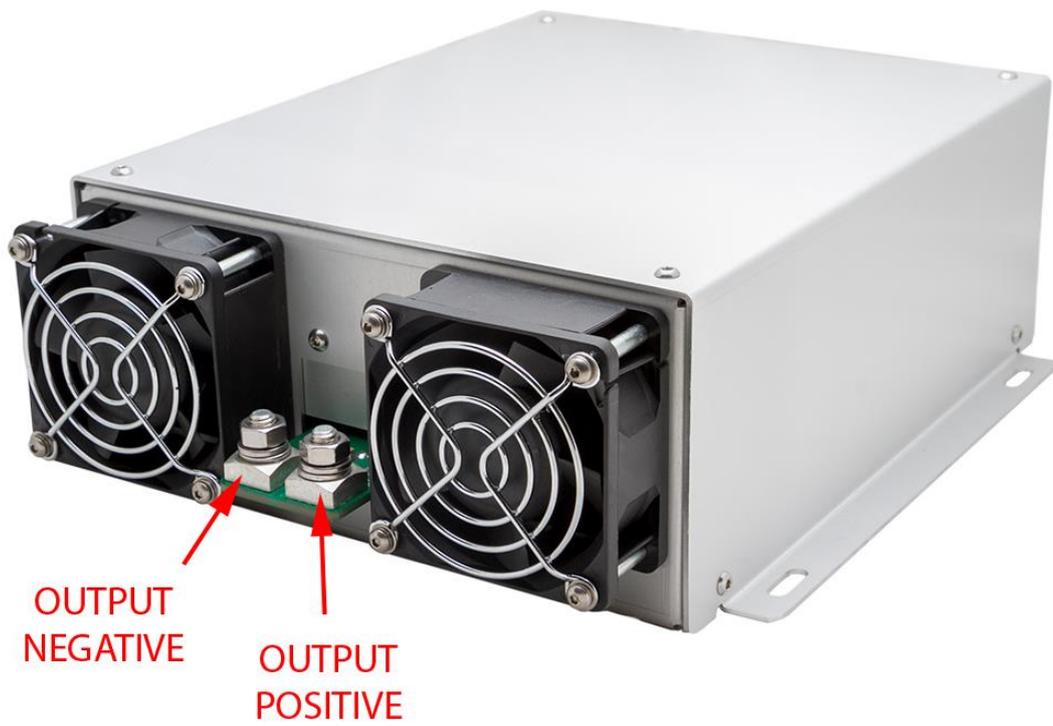
Diode and flashlamp (IPL, laser)



Cooling

The module contains fans for active cooling. No additional cooling is required.

Appearance



Connections, signals, signal description

+24V DC INPUT: Molex MiniFit MF-2F type

2
1

Feeds interface circuits of PDD-1000 with +24V DC voltage.
Maximum current consumption is 1A.

PIN (color)	DESIGNATION	DESCRIPTION
1 (red)	+24V DC	+24V DC positive
2 (black)	RETURN	+24V DC negative

INTERFACE: Molex C-Grid type

1	3	5	7	9
2	4	6	8	10

PIN (color)	DESIGNATION	DESCRIPTION
1 (black)	PULSE 1 RETURN	Return of Pulse 1 signal
2 (yellow)	PULSE 2	+5V TTL pulse should be applied to pin 2 and to pin 3 simultaneously in order to obtain pulsed current from PDD-1000. In cases if 0V is applied to one of these pins or at least one of these pins is unconnected, there will be no current from PDD-1000.
3 (yellow)	PULSE 1	+5V TTL pulse should be applied to pin 2 and to pin 3 simultaneously in order to obtain pulsed current from PDD-1000. In cases if 0V is applied to one of these pins or at least one of these pins is unconnected, there will be no current from PDD-1000.
4 (black)	PULSE 2 RETURN	Return of Pulse 2 signal
5 (white)	ENABLE RETURN	Return of Enable signal
6 (violet)	INTERFACE RETURN	Return of other Interface signals (namely Fault, Current program and +15V DC)
7 (red)	ENABLE	+5V DC applied to this pin enable PDD. While 0V is applied to this pin or pin is unconnected, module is disabled. Once <i>Fault</i> has occurred module is blocked till you eliminate fault cause, then <i>disable</i> module and <i>enable</i> it again.

8 (orange)	+15V DC AUXILIARY OUTPUT	Auxiliary +15V DC output. Maximum output current 50mA.
9 (blue-white)	FAULT	If module is <i>enabled</i> and some trouble has occurred, module automatically stops operations and sets <i>Fault</i> status (<i>Fault</i> loop is “closed”). In case of normal operations <i>Fault</i> loop is “opened”. Maximum allowed current in <i>Fault</i> loop is 50mA. At now Fault can be caused by overheating only
10 (green)	CURRENT PROGRAM	Voltage applied to this pin sets output current. 0-10V DC are linear with 0- I_{MAX} .

DC POWER INPUT: Molex Minifit MF-6F type

6	5	4
3	2	1

The connector provides PDD-1000 diode driver with power from buffer capacitor bank. All six pins must be used when driver is operated at maximum power.

PIN (color)	DESIGNATION	DESCRIPTION
1,2,3 (red)	DC POWER	Capacitor bank positive
4,5,6 (black)	RETURN	Capacitor bank negative

OUTPUT POSITIVE AND OUTPUT NEGATIVE: M6 studs

PIN (color)	DESCRIPTION
DIODE “+” (red)	To laser diode anode
DIODE “-” (blue)	To laser diode cathode

GROUND: M5 stud

Module should be grounded using this stud.
Grounding should be done before powering the system.

Grounding policy

By default OUTPUT POSITIVE, OUTPUT NEGATIVE and INTERFACE RETURN and isolated from the chassis’ ground (i.e. output and interface are floating).

Modifications with grounded anode or grounded cathode
are available upon request.

Operations notes

1. The proper sequence of driver's start up procedure is 'power -> enable -> pulse'. Other sequences are considered as incorrect
2. When driver is powered but disabled, fans rotate slowly;
once driver is enabled, fans will accelerate to a higher speed
3. Fault state is set when fault condition is met AND driver is enabled
4. To remove fault state one should disable driver and enable it again

Specifications

ELECTRICAL

INPUTS	
Power input voltage	300V by default (other on request)
Power input current	typically <5A
+24V DC input	+24V DC, 1A max
OUTPUT	
Maximum output voltage (V_{MAX})*	50V by default (up to 200V on request)
Maximum output current (I_{MAX})*	200A by default (other on request)
Peak power*	10kW
(*) $I_{MAX} * V_{MAX}$ shouldn't exceed maximum peak power (10kW)	
Pulse width	1ms - 100ms (other on request)
Risetime/falltime	<1ms (10-90% level)
Averaged power	1kW
Pulse repetition rate	Limited with pulse energy and maximum averaged power only
Current accuracy	<1% of I_{MAX}
Current overshoot	<1% of I_{MAX}
SAFETY	EMI as per EN 55011. Since module is a DC/DC converter other safety features must be realized in AC/DC converters used in system.
COOLING	No external cooling is required
ENVIRONMENT	
Operation temperature	0 ... +40 °C
Storage temperature	-20 ... +60 °C
Humidity	90%, non-condensing

MECHANICAL

Dimensions	See dimensional drawing below
Weight	Approx. 2.2 kg

Dimensions

