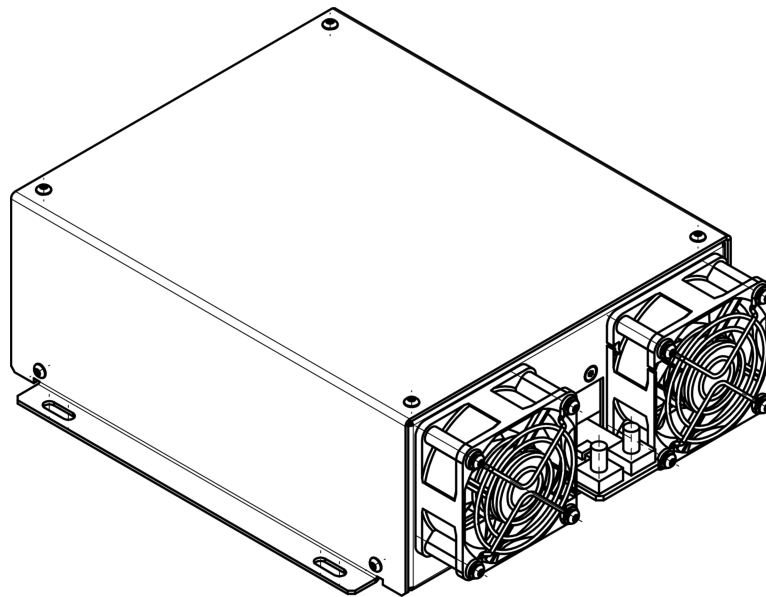


PDD-1000 pulsed diode driver

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 severely distort its behaviour.

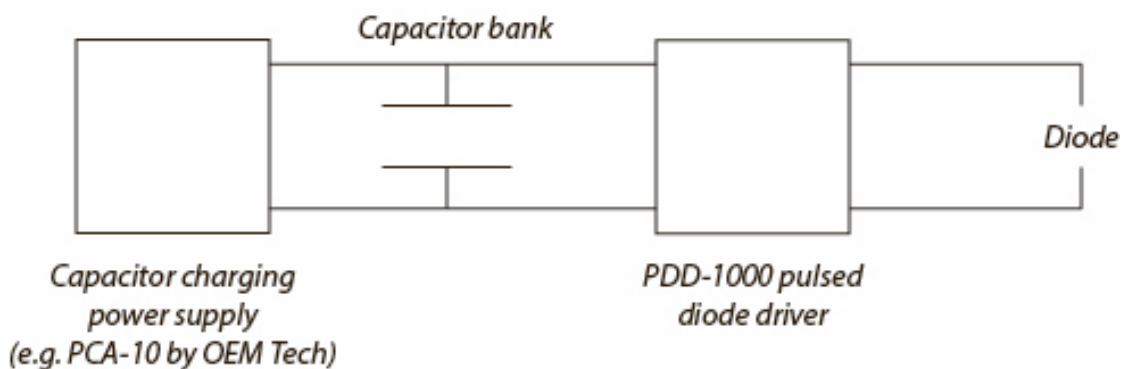


Overview / Applications

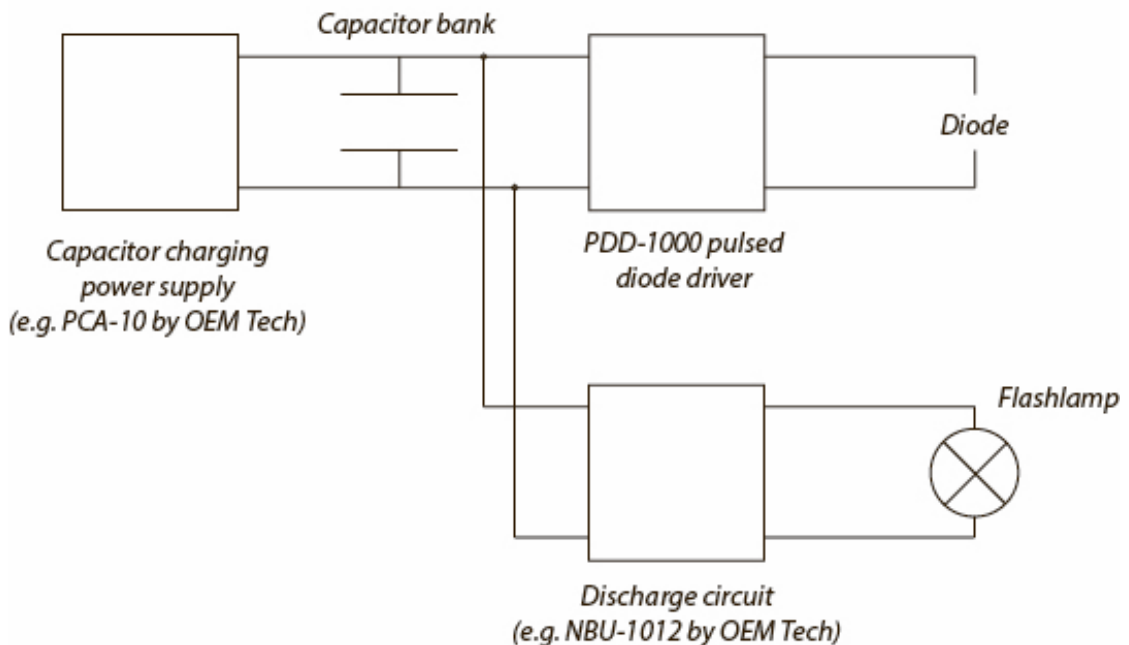
PDD-1000 is a series of high power pulsed diode drivers. Peak output power is up to 10kW (with user selectable I_{MAX} and V_{MAX}), averaged output power is up to 1000W.

Driver was especially 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 compositions also allows to use both flashlamp and diode applicators in the only system.

Diode only



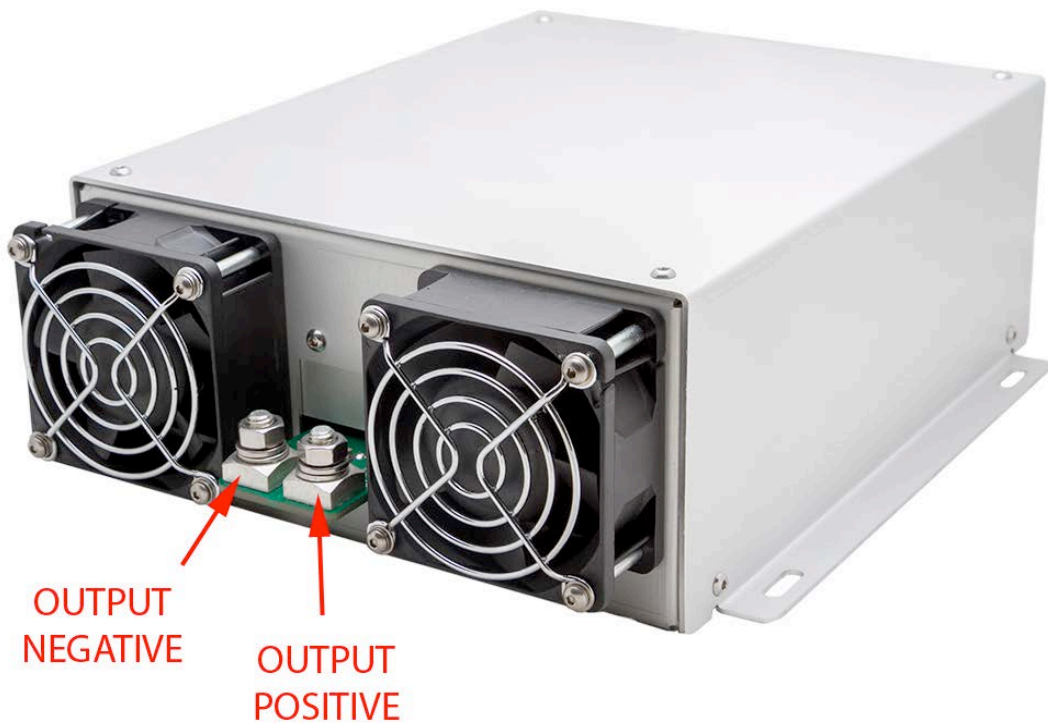
Diode and flashlamp (IPL, laser)



Cooling

Module is cooled with embedded fans. No additional cooling is required.

Appearance



Connections, signals, signal description

+24VDC INPUT: Molex MiniFit MF-2F type

| |
|---|
| 2 |
| 1 |

Feeds interface circuits of PDD-1000 with +24VDC voltage.
Maximal current consumption is 1A.

| PIN (color) | DESIGNATION | DESCRIPTION |
|-------------|-------------|-----------------|
| 1 (red) | +24VDC | +24VDC positive |
| 2 (black) | RETURN | +24VDC 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 to apply pulsed current to the output of PDD-1000. While 0V are applied to one of these pins or one of these pins is unconnected there is no current at the output of PDD-1000. |
| 3 (yellow) | PULSE 1 | +5V TTL pulse should be applied to pin 2 and to pin 3 to apply pulsed current to the output of PDD-1000. While 0V are applied to one of these pins or one of these pins is unconnected there is no current at the output of 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 +15VDC) |

| | | |
|-----------------------|--|---|
| 7 (red) | ENABLE | +5V DC applied to this pin enable PDD. While 0V are 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) | +15VDC AUXILIARY OUTPUT | Auxiliary +15VDC output. Maximal 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”. Maximal allowed current in <i>Fault</i> loop is 50mA. At now module rises Fault in the case of 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 |

Provides PDD-1000 diode driver with power from buffer capacitor bank. All six pins must be used when driver is operated at maximal 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 on request.

Operations notes

1. The proper sequence of driver's start up procedure is 'power -> enable -> pulse'. Other sequences are considered as faults
2. When driver is powered but disabled fans operate at lower speed; once driver is enabled fans accelerate to 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 |
| +24VDC input | +24VDC, 1A max |
| OUTPUT | |
| Maximal output voltage (V_{MAX})* | 50V by default (up to 200V on request) |
| Maximal output current (I_{MAX})* | 200A by default (other on request) |
| Peak power* | 10kW |
| (*) $I_{MAX} * V_{MAX}$ shouldn't exceed maximal 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 maximal 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 |
| Weigth | Approx. 2.2 kg |

Dimensions

