REVISIONS						
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TOLERANCES

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TITLE

OPERATING MANUAL, POWER SUPPLY MODEL 533

ANGULAR	SCALE	SIZE	FSCM	SHEET	DRAWING NUMBER	REV.
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The **Model 533** is a highly efficient, cost effective, voltage regulated, differential output, high voltage power supply designed to power the 8212A Pockels Cell Driver.

Caution: This power supply generates High Voltages. It should only be handled by qualified personnel.

Installation:

The Power Supply has (4) mounting holes that are approximately 0.13" in diameter and suitable for a #4 screw. All (4) screw holes are located in the corners of the PCB. Mount the unit to (4) appropriate standoffs using #4 screws. Two components are mounted on the backside of the PCB. These components are approximately 0.18" off the PCB surface. Their leads are connected to High Voltage, so an additional clearance is needed. Use 5/16" or taller standoffs for mounting.
Forced air application is always preferred. Mount the PCB so that the maximum amount of air flows across the top surface of the PCB and a smaller amount across the bottom. Rectifiers D6,7,16 and 17 along with T4 and T5 are the most sensitive to heat.
The power supply can run convection under low enough output power and maximum subjected surrounding temperature. The power supply can operate without airflow at 70W and 25ºC temperature.

Connections:

1) Power input
2) Power output
3) Control and I/O

1) The 24V DC input power enters the unit through J1. This connector is a 4 pin 0.156" center IDC (insulation displacement connector) style header. An example of a suitable mate is TE Connectivity 3-640426-4. Pins 1 and 2 are for the +24V and pins 3 and 4 are for 24V RTN (See Figure 2). Input current can be estimated from the formula below:

$$Iin \approx \frac{(Vout1 \times Iout1) + (Vout2 \times Iout2)}{Vin\_\min \times eff}$$

Where:
Vin_min = 23V
eff ~ 0.87

2) The high voltage output power exits the unit through connector J2. This connector is a Molex 39-30-3056. An example of a suitable mate is a Molex 39-01-4051. Use (3) crimp pins Molex 39-00-0039 for the housing. Use appropriate high voltage wire. Output current is set by the demanded load. Pin 1 is the +1kV pin, Pin 3 is the RTN pin and Pin 5 is the -1kV pin. Pins 2 and 4 are not used and are for high voltage spacing purposes (See Figure 2). Keep power and signal returns separate and return to their appropriate PCB returns.

3) Control and I/O's are processed through connector P1. This is a 10 pin, dual row, 0.1" pitch connector. This connector is a 3M 30310-5002HB. An example of a suitable mate is 3M 89110-0103. A 10-pin ribbon cable with the suggested mate works well here. The connector on the PCB is keyed and has Pin 1 clearly marked with an arrow. See Figure 2 for pinout details.

I/O Signal Functions

Enable – This input determines whether the Power Supply is creating high voltage or not. To enable the driver, apply a high signal between +2.4V and +24VDC. To disable the driver, apply a low signal between 0 and +0.5VDC or an open circuit. The input impedance of this signal is ~8 kΩ.
When enabled, the output voltage will climb to the value set by potentiometer R37 (for internal adjust, See Figure 1) or the value commanded by the Demand inputs (for external adjust).

+Demand and -Demand -- These (2) signals determine the amplitude of the output voltage when running in external adjust mode. They create of fully differential input with an input impedance of 20kΩ. Common mode voltages should remain between ground and +12V. An analog input voltage difference of 0 to 5V demands 0 to +Full V and 0 to -Full V. This function can also be used single ended by tying the -Demand to GND. An internal circuit will clamp the demand amplifier output if the input difference exceeds ~5.26V, thereby limiting the maximum demanded output voltage.

+Vmon – The +Vmon output is a scaled representation of the positive output voltage. 0 to +5V (+/-2%) represents 0 to +full output voltage. The output impedance of this signal is ~1kΩ.

-Vmon – The -Vmon output is a scaled representation of the negative output voltage. 0 to +5V (+/-2%) represents 0 to -full output voltage. The output impedance of this signal is ~1kΩ.

Power Input:

Apply a regulated 23 to 25VDC input to the Power Supply for proper operation. There is an under-voltage lockout circuit that activates and shuts the unit down at ~18.8V.
Ensure the input supply is capable of supplying a minimum current as calculated by the I_{in} formula in Connections section 1).
An additional overhead of 25% is recommended.

Power Output:

The output current of the driver is determined by the output load. The power supply can typically deliver 62.5W max per side ranging from 750V to 1kV. The output can be operated lower than 750V, but the power will be de-rated.

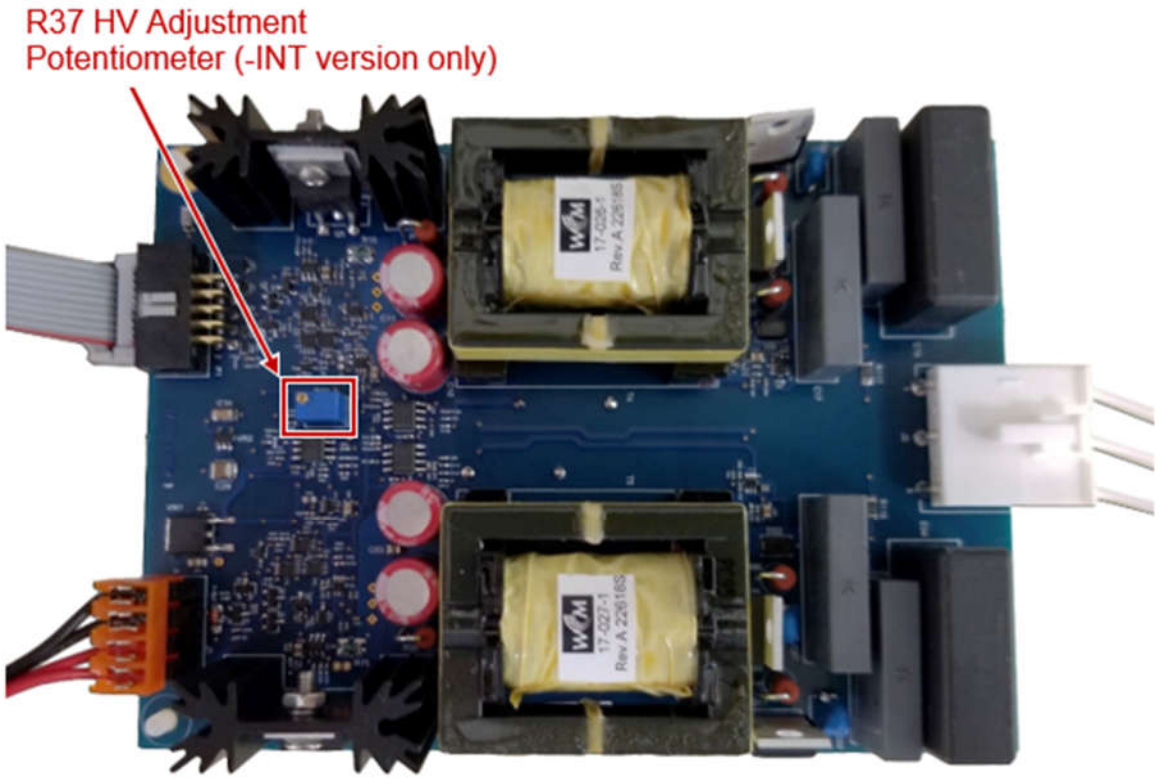
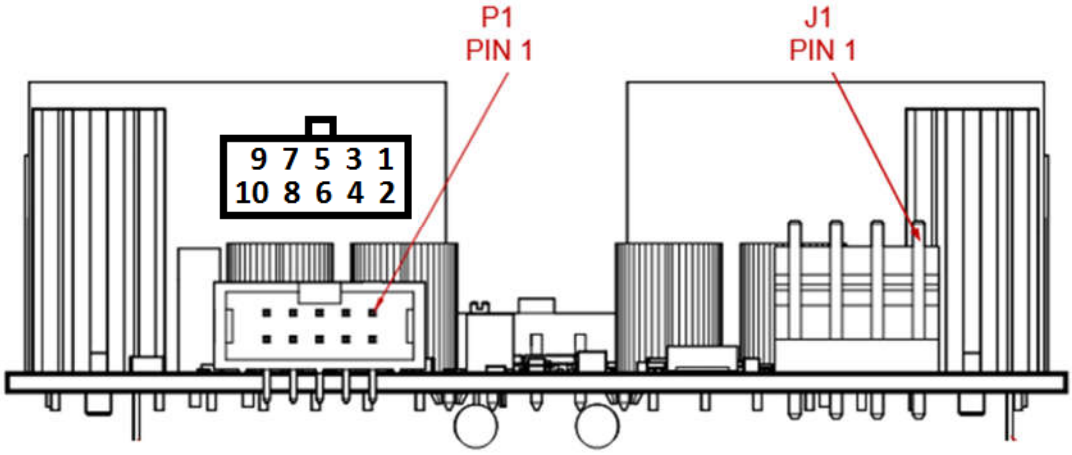
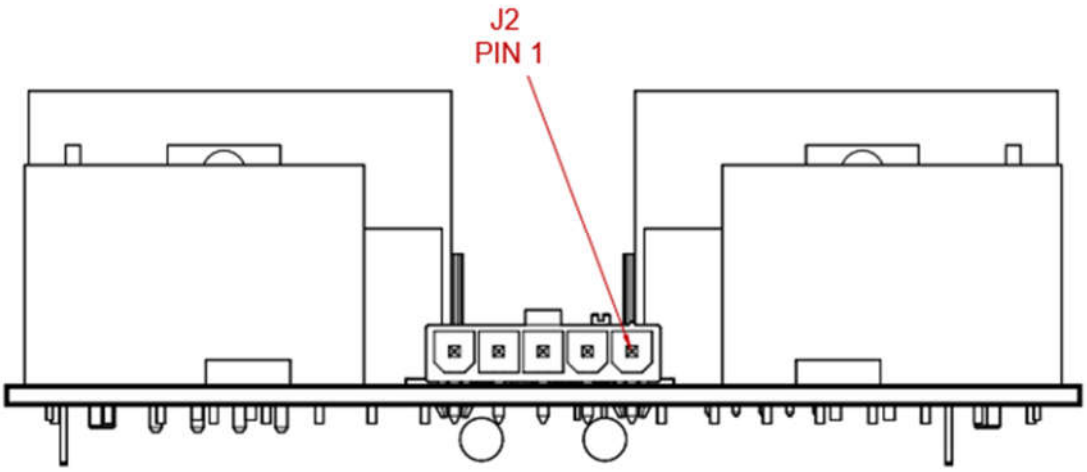


Figure 1: HV Adjustment Potentiometer



P1 CONNECTOR			
PIN	**FUNCTION**	**PIN**	**FUNCTION**
1	Enable	6	GND
2	GND	7	+Vmonitor
3	+Demand	8	GND
4	GND	9	-Vmonitor
5	-Demand	10	GND

J1 CONNECTOR	
PIN	**FUNCTION**
1	+24 VDC
2	+24 VDC
3	24 VDC RTN
4	24 VDC RTN



J2 CONNECTOR	
PIN	**FUNCTION**
1	+1 kV
2	NC
3	RTN
4	NC
5	-1 kV

Figure 2: Interface Details

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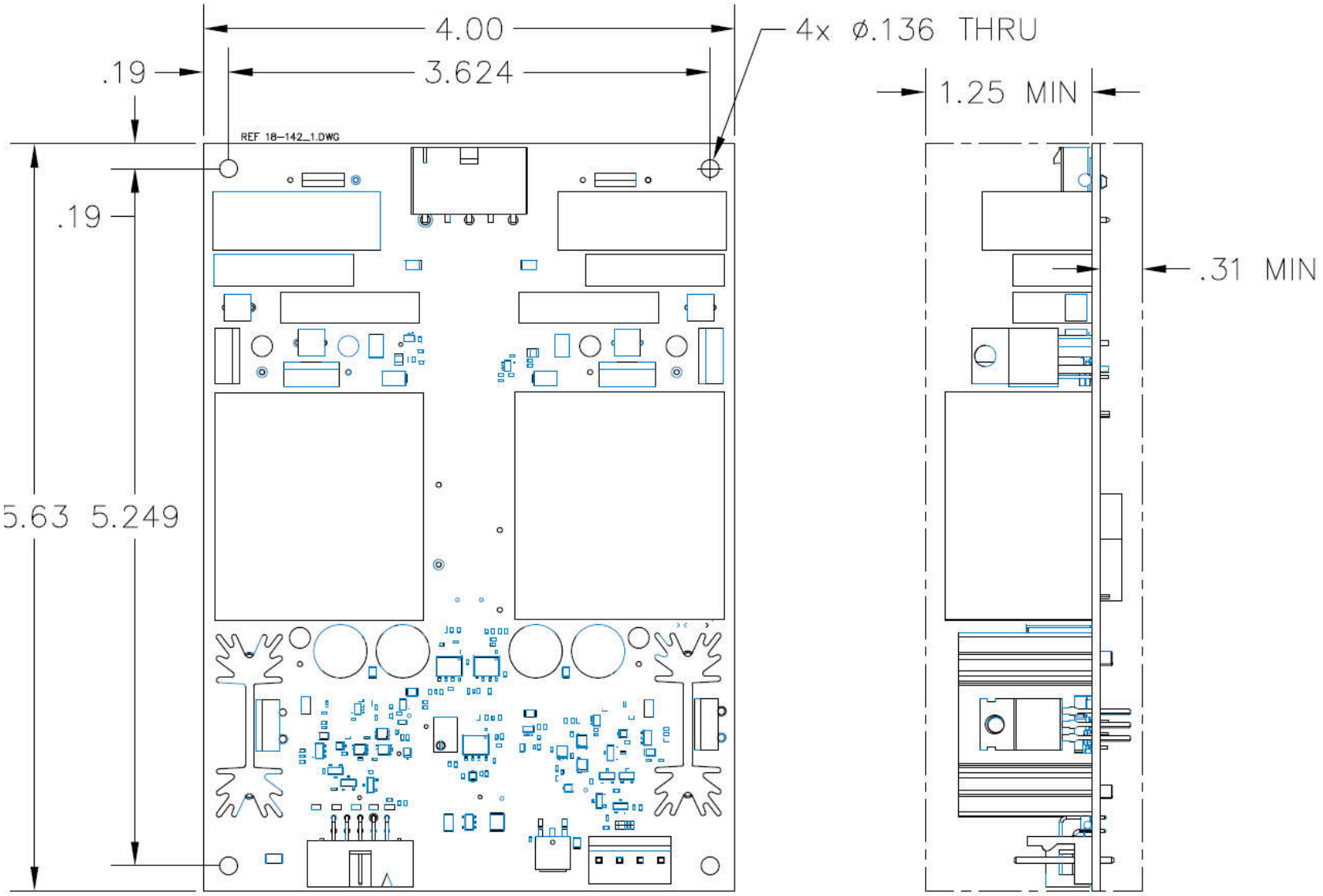

Figure 3: Mechanical Outline Drawing