

PVM500/DIDRIVE10 Hydrogen and Chemical Production, Corona Cell and Plasma and Dielectric Driver Instructions

Intended for capacitive loads and single ended plasma gas displays.

For 115vac operation only. Use a 200 watt step down for 220 volt operation

This useful high frequency driver allows the user to tune to a capacitive load within the range of 5 to 150 pfd. This value is found in many corona cells and plasma filled vessels. The maximum voltage across the capacitive load is a function of the circuit Q and can peak to levels that can destroy the out put transformer and associated circuitry.

The unit is not totally "user friendly" and is intended for use by those experienced in powering up these resonant capacitive loads. Caution as the output transformer can be easily damaged if allowed to spark over encapsulation.

Controls

VA1..... Voltage level control

S1/RFreq.....Main power switch and frequency control

S2....HI/LO input voltage switch.

Always start with this switch in the "LO" position

Rdc....Duty-cycle/power control

NEON1...Power on indicator and reset lamp

AMP....Meter 0-5 amps for power input monitoring

FUSE....3 amp slo- blow



Operation

1. Connect HV output lead to load. Note output is referenced to chassis ground that is earth ground via the green lead of the power cord.
2. Verify that the **HI/LO** switch is in the down position and **Rdc** is fully CCW/OFF.
3. Plug into a 115 vac source and rotate **VA1** midrange. Apply power via rotating **S1/RFreq** control until it clicks on noting that the `NEON1 indicator lamp comes on.
4. Slowly adjust **S1/RFreq** until the display starts to activate. IMPORTANT! This adjustment tunes the load capacitance to the units intrinsic inductance and should be cautiously set to a peak reading. It preferably should be set on the CCW side of the peak meter reading. Note that the S1/RFreq control increases frequency in the CCW direction. Now slowly rotate VA1 to full CW noting desired display effect. Also note reading on the **AMP** meter for reference.
5. Repeat step 4 if necessary for required effect
6. You may switch the **HI/LO** to HI for more power if output is below .5 amps in the LO position. Do not allow to exceed two amps and check transformer and circuit for heating and any excessive corona around transformer or leads.
7. Now set **Rdc** to the desired current reading or display texture. Some loads may cause premature shutdown in using **Rdc**

Special Notes

Always check the output transformer for excessive heating, corona or arcing preferably in the dark. Do not allow to operate in this state as the transformer will burn out. It may take at least 30 minutes for transformer to overheat.

A **SHUT DOWN** circuit will trigger if output voltage becomes excessive, disabling the output. Reset will require power removal and waiting several minutes before reapplying as indicated by the neon lamp fully extinguishing. This can be readjusted by slowly rotating the orange trimpot closest to the front panel CCW for more output or vice versa if output is excessive. **However if you burn out the transformer it will cost you \$50.00 for factory replacement.** You might want to contact the factory at <bob@amazing1.com> before moving this control from it's factory setting.

Even though the out put lead is rated for 40 kv, it must be clear of all conductive objects to prevent breakdown.

Certain loads may have different Q factors that will effect operation. Q factors is determined by the ratio of circuit reactance to resistance of the load. Reactance being the inductive and capacitive values at resonance. The resistance part is determined by component losses and the amount of useful corona or plasma ionization produced.

Always attempt to operate **RF freq just slightly** below the current peak as indicated on the **AMP** meter. This is especially important when operating above 1 amp to avoid overheating the switching transistors

CAUTION: Contact with the bare metal controls and other objects may cause annoying burns. This is especially noticeable when powering single ended plasma displays that are within several feet of the user. Insulated tubing is placed on the control shafts to help avoid these annoying shocks and burns.

TRANSFORMER RESONANT SPECIFICATION

Transformers use our own standard tooled UU69 ferrite core with the following specs: CORE is 69 x 39 x 23 mm, $\mu=2000$
 $A_e=2.3$ cm sq $L_e=22.9$

2500 turns 0 gap =16.5 H	Self resonant.....	3.8 pfd/20khz
2500 turns 4 mil gap =8.5 H.....	.83 pfd/60khz.....	7.5 pfd/20khz
2500 turns 8 mil gap =5.7 H.....	1.23 pfd/60khz.....	11 pfd/20khz
2500 turns 20 mil gap =2.9 H.....	2.4 pfd/60khz.....	22 pfd/20khz

1000 turns 0 gap =2.6 H.....	2.7 pfd/60khz.....	24 pfd/20khz
1000 turns 4 mil gap = 1.36 H.....	5 pfd/60khz.....	46 pfd/20khz
1000 turns 8 mil gap =.9 H.....	7 pfd/60khz.....	70 pfd/20khz
1000 turns 20 mil gap =.46 H.....	15 pfd/60khz.....	150 pfd/20khz

The above possible combination combined with the adjustable frequency of from 20 to 60 khz allow resonating any capacitive cell from 0 to 140 pfd and also gives plenty overlap

Units purchased with the 2500 turn coil will have 2 mils air gap per side. You may take apart and change only the gap on the secondary side to bring larger load capacities within tuning range.

Leads must be as short as possible for low capacitive loads<25 pfd

#COIL1000S turn epoxy potted coil may be ordered39.50