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

Intended for capacitive loads and single ended plasma gas displays up to .1 µfd*
For 115Vac operation only (use a 1500 watt step down transformer for 220 volt operation)

This useful high frequency driver allows the user to tune to a capacitive load within the range of 5 pfd to 150 pfd. This value is found in many corona cells and plasma filled vessels. *See below Data or Contact tech@amazing1.com for higher values of capacitive loads up to .1 µfd.

Please take note that the maximum voltage across a capacitive load is a function of the circuit Q and can peak to levels that can destroy the output transformer and associated circuitry. Therefore the unit in 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....5 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 or meter 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 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 3 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 30 minutes for transformer to overheat. **However if you burn
out the transformer it will cost you $50.00 for factory replacement.**

Even though the output lead is rated for 40 kV, it must be clear of all conductive objects to prevent voltage 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 2 amps 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 SPECIFICATIONS FOR THOSE WHO WISH TO USE FOR HIGHER LOAD CAPACITY
UP TO .1µFD**

Transformers use our own standard tooled UU69 ferrite core with the following specs: CORE is 69 x 39 x 23 mm, u=2000
Ae=2.3 cm sq    Le=22.9

**Approximate Values for Load Capacity 2500 Turn Included Bobbin**

2500 turns 0 gap =16.5 H (6.2M)@60kHz .............. .04 pf @60kHz Self resonant
2500 turns 4 mil gap =8.5 H(3.2M)@60kHz .............. .31pf @60kHz
2500 turns 8 mil gap =5.7 H(2.1M)@60kHz .............. .46 pf @60kHz
2500 turns 20 mil gap =2.9H(1M)@60kHz .............. .91 pf @60kHz

2500 turns 0 gap =16.5 H (2.07M)@20kHz ..............3.8 pf @20kHz
2500 turns 4 mil gap =8.5 H(1.06)@20kHz .............. 7.5 pf @20kHz
2500 turns 8 mil gap =5.7 H(.72M)@20kHz ............. 11 pf @20kHz
2500 turns 20 mil gap =2.9H(.36M)@20kHz ............ 22 pf @20kHz

**Approximate Values for Load Capacity 1000 Turn Optional Bobbin**

1000 turns 0 gap =2.6 H(.98M)@60kHz ................. 2.7 pf @60kHz
1000 turns 4 mil gap = 1.36 H(.51M)@60kHz ............5 pf @60kHz
1000 turns 8 mil gap =.9 H(.34M)@60kHz................7.8 pf @60kHz
1000 turns 20 mil gap =.46 H(.17M)@60kHz ............15 pf @60kHz
The above possible combination of the 1000 turn coil combined with the adjustable frequency of from 20 to 60 kHz allow resonating any capacitive cell from 2.7 to 138 pfd and provides plenty overlap.

TRANSFORMERS with the 1000 or 2500 turn secondary 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 <2.5 pfd

#COIL2500S turn epoxy potted coil included on basic unit 20 to 60 kHz tunes up to 25 pfd .................................$39.50
#COIL1000S turn epoxy potted coil may be ordered tunes 2.7 to 138 pfd .............................................................$39.50

We have roughly calculated transformer secondary turns at the mid frequency of 40kHz for those who need to go 1nf, 10nf and 100nf.

#COIL1000S tunes 2.7 to 138pfd
#COIL200T tunes 1nf at 40kHz
#COIL60T tunes 10nf at 40kHz
#COIL15T tunes 100nf at 40kHz

Coils are sold is sets of four pieces only for .................................................................$100.00