DYNAPOWER CORPORATION

USER'S MANUAL

SINGLE PHASE DRIVE FIRING CIRCUIT

MODEL NUMBER: EU-10066C

INVENTORY NUMBER: EUC-7-100660000

DYNAPOWER CORPORATION

85 MEADOWLAND DRIVE

SOUTH BURLINGTON, VERMONT 05403

PHONE: 802-860-7200

TOLL FREE: 800-292-6792

FAX: 802-652-1371

www.dynapower.com

techsupport@dynapower.com

CONTENTS

Word File: 066OCOM.DOC
Written: January 1994

1. SPECIFICATIONS

Input Power ..... 120, 240, 330, 480 Vac, 50/60 Hz

Current Regulation ..... ± 1%

Voltage Regulation ..... ± 1%

Output ..... 2 isolated hard-fire gate pulses

2. GENERAL DESCRIPTION

EUC-7-100660000

SINGLE PHASE DRIVE FIRING CIRCUIT

MODEL EU-10066C

The EU-10066C circuit is an electronic circuit designed to regulate the output of single-phase input, thyristor phase controlled power sources. Output may be controlled in constant voltage mode or constant current mode with automatic crossover.

The output of the circuit is two isolated 'hard-fire' thyristor gate firing pulses. The hard-fire pulse has a high current, short duration leading edge followed by a 'backporch' of ≈ 300 ma gate current. The gate pulses are synchronized to the input power to the circuit.

The circuit can be powered by input voltages of 120, 240, 330, or 480 Vac. It will operate with either 50 Hz or 60 Hz line frequency.

The circuit generates a reference voltage for the output controls. This reference voltage may be clamped to zero by the application of a 'CLAMP' logic signal. Clamping the reference will turn off the regulator, thus turning off power supply output. When the 'CLAMP' command is removed, the reference (power supply output) will ramp to setpoint in ≈ 2 seconds.

FEEDBACK

The EU-10066C requires current feedback (0 - 50 mv) from a current shunt connected into the positive bus and a voltage feedback signal from the negative output bus of the power supply.

OVERCURRENT

The circuit has an overcurrent detector circuit. When a preset current level is exceeded, the regulator will shut down for ≈ 3 seconds after which output will be restored.
If the fault that cause the overcurrent has not been cleared, the circuit will continue to trip.

A voltage of ≈10 volts on terminal 10, LED D17, and relay CR1 will signal a TRIP condition.

ZERO CURRENT

The circuit will generate a voltage of ≈10 volts on terminal 9 when both output controls are turned up and no load current flows. The logic signal is connected to terminal 9 by JP2.
ZERO CURRENT is also indicated by LED D17 and relay CR1.

CURRENT SIGNAL

An adjustable (0-10) positive voltage, proportional to load current is available for ACDC applications. The voltage is connected to terminal 9 by JP3.

Note: Only one of above jumper connections (JP2 or JP3) should be made.

TERMINAL FUNCTIONS

EU-10066C

		N.C	Overcurrent Relay
		N.O	Overcurrent Relay
		C	Overcurrent Relay
	K2	-V	Voltage Feedback In
	G2	+ REF	Reference Out
	K1		
	G1	CLAMP	Output Inh. In
		TRIP	Overcurrent Out
		ZERO I.	ACDC Output
		ACDC	ACDC In
		AVC	Voltage Ref. In
		ACC	Current Ref. In
	480	-SHUNT	Current Feedback
Input	330	+SHUNT	Current Feedback
Power	240	GND	Circuit Common
	120	+12	
	0	-12	

3. CIRCUIT ADJUSTMENTS

For proper operation of the circuit (power supply), five adjustments are made on the circuit:

ADJUSTMENT FUNCTIONS

CURRENT SIGNAL (P1) sets the signal for the ACDC option.

TRIP LEVEL (P2) sets the overcurrent detector setpoint.

CURRENT LIMIT (P3) sets the maximum output current of the power supply when the current control is at 100%. The adjustment must be made with enough load on the power supply so that the power supply voltage is not at its maximum at rated output current.

BIAS (P4) sets the bias of the shunt amplifier. The bias should be set to ± .005 volts. If the bias is set too much negative, there will be a deadband at the low end of the current control. If the bias is set too much positive, there will be output when the current control is set to zero.
The bias is measured between circuit common (terminal 3) and pin 6 of IC12.

VOLTAGE LIMIT (P5) sets the maximum output voltage of the power supply when the voltage control is at 100%.

ADJUSTMENTS

Power Supplies with Voltage Control (AVC) only.

a Set AVC control to zero.

b. Measure output of shunt amplifier at pin 6 of U12. Should be ±.005 volts, adjust with P4 if necessary.

c. Light load in tank.

Bring AVC control to 100%

Set supply output voltage to rating with VOLT LIMIT P5.

d. Heavy load in tank.

Slowly bring up AVC control and observe current. If current wants to exceed supply rating, adjust CURR LIMIT P3.

Power Supplies with Current Control (ACC) only.

a. Set ACC control to zero.

b. Measure output of shunt amplifier at pin 6 of U12. Should be ±.005 volts, adjust with P4 if necessary.

c. Light load in tank.

Slowly bring ACC control to 100%.

Set supply output voltage to rating with VOLT LIMIT P5.

d. Heavy load in tank

Slowly bring ACC control to 50%.

Output current should be approximately 50% of rating

Adjust CURR LIMIT P3 if necessary.

e. Slowly bring ACC control to 100%.

Set current to power supply rating with CURR LIMIT P3.

Power Supplies with Voltage and Current Control.

a. Set output controls to zero.

b. Measure output of shunt amplifier at pin 6 of U12. Should be ±.005 volts, adjust with P4 if necessary.

c. Light load in tank.

Set ACC control to 100%.

Set supply output voltage to rating with VOLT LIMIT P5.

d. Set ACC control to zero, AVC control to 100%.

Heavy load in tank.

Slowly bring ACC control to 50%.

Output current should be approximately 50% of rating

Adjust CURR LIMIT P3 if necessary.

e. Slowly bring ACC control to 100%.

Adjust current to supply rating with CURR LIMIT P3.

Power Supplies with Automatic Current Density Control (ACDC).

a. Have available the smallest and largest load to be used.

b. Set ACC control to 100%.

Set CURR SIG P1 control on drive circuit to about 50% rotation.

Set the ACDC control to about 30%.

c. Set small load into tank.

Adjust AVC control to obtain correct current for this load.

d. Set larger load into tank.

Adjust the ACDC control to obtain a current about 10% higher than the correct current for this load.

e. Set small load into tank.

Adjust the ACDC control to obtain the correct current for this load.

f. Set large load into tank.

Adjust the ACDC control to obtain the correct current for this load.

g. Repeat steps e and f until the two proper current values are obtained when switching between the two loads.

4. BENCH TEST

Measurements are referenced to GND terminal

1. Apply 120 Vac to the 0 and 120 terminals.

2. Measure voltage on terminal 1, should be -12, ± .5 Vdc

3. Measure voltage on terminal 2, should be +12, ± .5 Vdc

4. Measure at pin 6 of shunt amplifier U12

   Should be between 0 and ± .005.

   Set with P4 if necessary.

5. Measure voltage on terminal 13, should be ≈ +2.5 Vdc

6. Measure voltage between G1 and K1, G2 and K2

   Should be zero

7. Jumper REF, ACC, and AVC terminals together

8. Measure voltage between G1 and K1, G2 and K2

   Should be ≈ 8 Vdc.

5. 10066A REPLACEMENT

The EU-10066C is a direct replacement for the EU-10066A-0 and the EU-10066A-A circuits.

If the EU-10066C is replacing an EU-10066A-0 place the jumper on JP2.

If the EU-10066C is replacing an EU-10066A-A place the jumper on JP3.