DYNAPOWER CORPORATION

USER'S MANUAL

EU-10013F, Rev. B

6-PULSE THYRISTOR FIRING CIRCUIT

INVENTORY NUMBER: EUF-7-100130002

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Word File Name: 013OFBM

October 1992

SPECIFICATIONS

Input Power	115 Vac, 50/60 Hz
Control Voltage	0 - 3 Vdc
Gate Pulse Control Range	0 - 240°
Control Input Resistance	1000 ohms
Peak Gate Voltage	15 Volts
Peak Gate Current	2.5 Amperes
Gate Pulse Rise Time	< 2us
Back Porch Gate Current	150 ma
Firing Order	1-4-5-2-3-6
Gate Isolation	2000 Vdc

6-PULSE FIRING CIRCUIT
PART NUMBER EU-10013F, REV.B
INVENTORY NUMBER EUF-7-100130002

2.0 GENERAL

The EU-10013F Firing Circuit is used to provide gate firing pulses for 6 pulse thyristor controlled power supplies.

The circuit generates six isolated gate firing pulses, synchronized to the 115 Vac input power. The gate pulse is a 'hard fire' pulse which has fast rising, high current leading edge of short duration followed by a 'backporch' to sustain gate current. The individual gate circuits are powered through isolated transformer windings. The gate circuit is isolated from the logic circuitry by opto-couplers.

The gate pulses are shifted in response to a dc signal applied to the control input terminals. The gate pulse has a range of approximately 240°.

The circuit can generate gate pulses without the presence of an input signal. This is done by an on-board 'open loop' control, a single turn potentiometer, which is selected by a jumper connection to the circuit terminal strip. This feature is useful when trouble shooting the power supply.

2.1 GATE OUTPUT CIRCUIT

The gate output is a 'hard fire' pulse. The initial gate current is ≈ 2.5 amperes with a rise time of less than 2 us. The duration of the initial gate current is ≈ 8 us. The gate current then settles to a level of ≈ 150 ma.

The firing pulses are brought out from a terminal strip. An LED at each output will be ON when there is output at the gate terminals. These LED indicators do not indicate that a thyristor is operating properly.

2.2 PHASING

The gate pulse output of the circuit must be synchronized or locked to the power supply input voltage, i.e. the circuit control power. Without line lock, the power supply will not operate properly. The gate pulse firing order is 1-4-5-2-3-6. In 6-pulse thyristor circuits the gate pulses must be connected to the proper thyristor to obtain correct operation. Therefore, some standard must be used to match the thyristors to the gate pulses from the firing circuit.

The power to the firing circuit must be referenced to L1-L2 of the input power.

2.3 OUTPUT CONTROL

A DC control voltage is required to control the output of the circuit, ≈3 volts will give maximum output from any 6 pulse thyristor rectifier circuit.

2.4 CIRCUIT CONFIGURATION

Logic levels applied to the terminal strip select the following:

50 HZ - a jumper from 8 to 7 selects 50 Hz operation

an open defaults to 60 Hz.

OPEN LOOP - a jumper connection from terminal 8 to 6 will allow circuit output control with an on-board potentiometer. This is a trouble-shooting mode that allows output control of a power supply without the use of a regulator or an external voltage source.

Clockwise rotation of this control will give firing circuit output. There is low-end deadband in this control.

The control should always be left at maximum ccw rotation when it is not in use.

BENCH CHECK

1. Connect 115 Vac to the circuit

   All LEDs should be OFF.

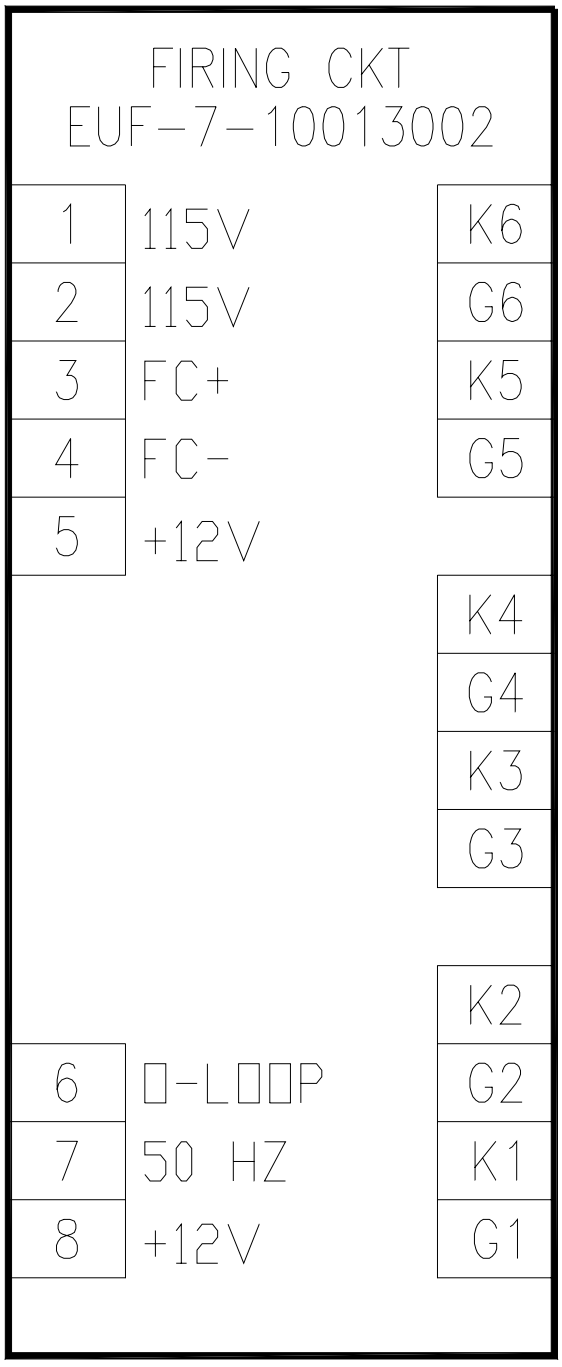
   All Gate-Cathode voltages should be zero.

2. Jumper terminal 5 to terminal 3.

   All LEDs should be ON

   All Gate-Cathode voltages should be >12 Vdc

This test will not reveal any problems that may occur when the circuit is installed in a power supply.


FIRING CKT
EUF-7-10013002
1
115V
2
115V
3
FC+
4
FC-
5
+12V
6
□-L□□P
7
50 HZ
8
+12V
K6
G6
K5
G5
K4
G4
K3
G3
K2
G2
K1
G1