INSTRUCTION MANUAL

KEPCO/TDK™

EFX

40 ~ 50 kHz - 4 OUTPUT SWITCHING POWER SUPPLIES

MODEL EFX 050T-1-21037

I-INTRODUCTION

SCOPE OF MANUAL. This instruction manual contains information for the installation and operation of the Kepco Model EFX 050T-1-21037 Swiching Power Supply.

DESCRIPTION. (Refer to Fig. 1). The Kepco Model EFX 050T-1-21037 converts the a-c input source voltage into four (4) source-isolated stabilized d-c outputs as listed in Table 1 below. Operating in a highly efficient, pulse-width modulated switching mode, the Model EFX 050-T-1-21037 features a "soft-start" circuit to prevent excessive inrush current, an overvoltage protector circuit sensing the principal output and a power limit circuit, protecting against short circuits and excessive power output.

The EFX 050-T-1-21037 is of open frame, single board construction. The d-c outputs and the a-c input are terminated on separate, latching type connectors, mounted onto 4-inch long "flying" leads.

MODEL	PRINCIPAL OUTPUT			AUXILIARY OUTPUTS								
		@ 50°C	@71°C		@ 50°C	@ 71°C		@ 50°C	@ 71°C		@ 50°C	@ 71°C
EFX 050T-1 21037	5V	6A	2.4A	– 24V	0.2A	0.1A	12V	1.5A	0.6A	– 12V	0.5A	0.2A

TABLE 1 OUTPUT RATINGS, MODEL EFX050T-1-21037
NOTE: Total Power Output 58.8W @ 50°C

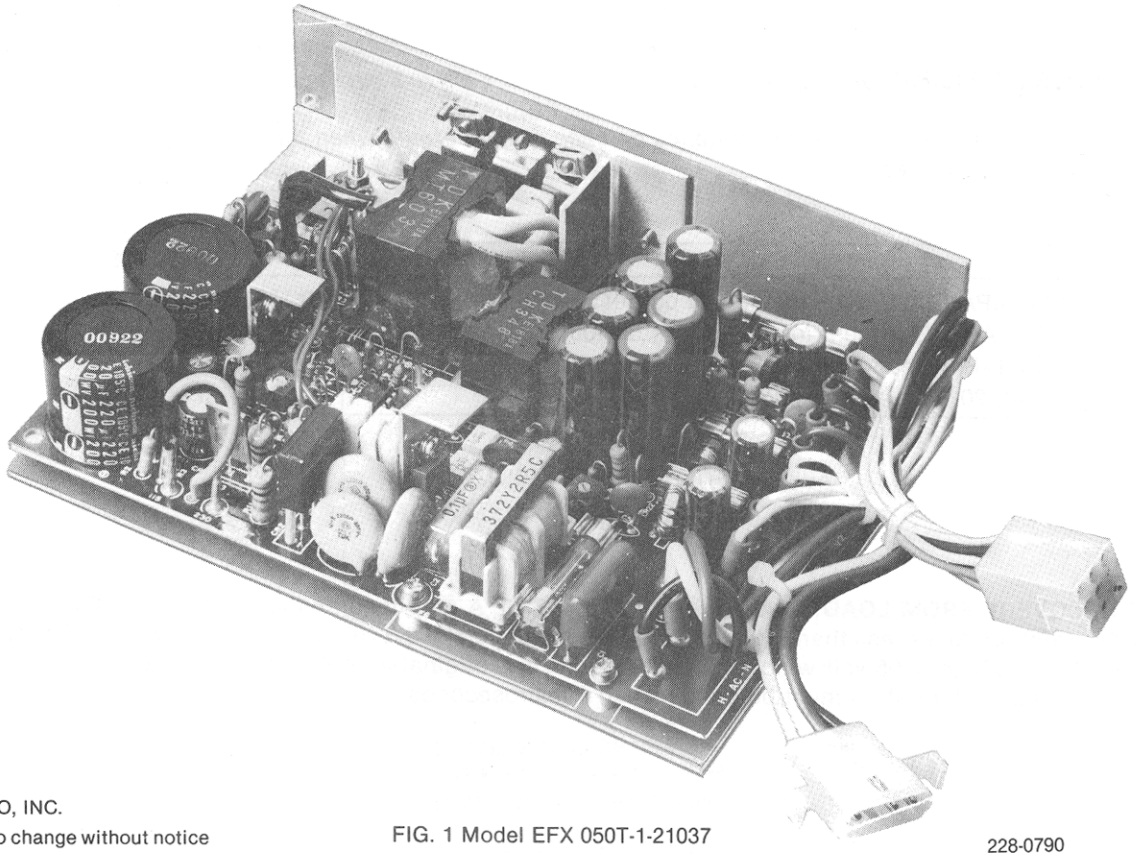


FIG. 1 Model EFX 050T-1-21037

II-SPECIFICATIONS

INPUT VOLTAGE: 100 to 130V a-c or 200 to 260V a-c, (Selectable, see Section III), 47 to 440 Hz, single phase.

BROWNOUT VOLTAGE: 90V a-c/180V a-c. The power supply will function at the brownout level with minor degradation in the specifications for ripple, stabilization and holding time.

INPUT CURRENT: (Maximum, at full load and at the minimum input voltage): 2A @ 100V a-c, 1A @ 200V a-c input. Typical, at full load and at the nominal input voltage: 1.8 @ 115V a-c, 0.9 @ 230V a-c input.

INPUT PROTECTION AND SOFT START: The power supplies is protected by a fuse against short circuits in the input. A soft start circuit prevents excessive input surge current at the initial turn-on.

EFFICIENCY: Greater than 70% typical.

OUTPUT RATINGS: See Table 1.

OUTPUT ADJUSTMENT RANGE: ± 10%, Principal Output only, Auxiliary Outputs are fixed. The location of the output adjustment rheostat is shown in Fig. 3.

OUTPUT SETTING ACCURACY: All auxiliary outputs are set to within ± 5% of their tabulated value when the principal output is set to the nominal value (5 volts) and loaded with 3A.

CURRENT LIMIT AND SHORT CIRCUIT PROTECTION: Each of the four (4) outputs is protected against short circuits by means of a fuse on the printed circuit board, see Fig. 3. In addition, an internal power limit circuit is activated when the total output power exceeds the rated power by approximately 30%.

OUTPUT STABILIZATION: Refer to Table 2.

INFLUENCE QUANTITY	PRINCIPAL OUTPUT Typ.	Max.	AUXILIARY OUTPUTS Typ.	Max.
SOURCE EFFECT (Min-Max)	<0.1%	0.5%	<0.5%	1.0%
LOAD EFFECT (20—100%)	<0.2%	1.0%	<5.0%	10.0%
TEMPERATURE EFFECT (0—50°C)	<0.5%	1.0%	<0.5%	1.0%
COMBINED EFFECT (Envelope)	<0.8%	2.5%	<6.0%	12.0%
TIME EFFECT (drift, 8 hr @ 25°C)	<0.02%	0.1%	<0.02%	0.1%

TABLE 2 OUTPUT STABILIZATION

OUTPUT CROSS STABILIZATION: See Table 3.

NOTE: This specification expresses the influence on each of the outputs when the load on another output is changed by the amount listed.

OUTPUTS	Typ.	Max.
PRINCIPAL OUTPUT (Change any output 20-100% of rated load):	0.1%	0.5%
AUXILIARY (Change principal output 50-100% of rated load):	3%	6%
AUXILIARY (Change load on any output, other than the principal output, 20-100% of rated load):	0.1%	0.5%

TABLE 3 OUTPUT CROSS STABILIZATION.

OUTPUT RECOVERY FROM LOAD CHANGES (ALL OUTPUTS): A step load change from 50 to 100% of the rated load current produces less than 5% output voltage excursion (or 0.5 volt, whichever is greater). Recovery occurs to within 0.5% (or 0.05 volt whichever is greater) of the original output voltage setting in less than 5 milliseconds. Step-load duration must be greater than 5 microseconds.

OUTPUT RIPPLE AND NOISE: See Table 4.

FREQUENCY COMPONENT	PRINCIPAL OUTPUT		AUXILIARY OUTPUTS	
	Typ.	Max.	Typ.	Max.
2x Source frequency	25mV p-p	50mV p-p	50mV p-p	100mV p-p
2x Switching frequency	50mVp-p	100mV p-p	50mV p-p	100mV p-p
Spike Voltage (to 10MHz)	1% E_o +50mV p-p max.		1% E_o + 50mV p-p max.	

TABLE 4 OUTPUT RIPPLE AND NOISE.

OUTPUT HOLDING TIME: On a-c input interruption or failure, the d-c output will be maintained for a minimum of 20 milliseconds (30 ms typical) at full load and nominal input source.

OVERVOLTAGE PROTECTION: The principal output is monitored by a sensing circuit with a threshold setting between 6.0 to 6.9 volt. An overvoltage above the threshold value will shut down the principal oscillator and thereby reduce all outputs to zero volts.

NOTE: The overvoltage circuit is reset by interrupting the a-c input for approximately 10 seconds.

AMBIENT OPERATING TEMPERATURE RANGE: 0° to 50°C.

NOTE: For operation to 71°C, output current for all outputs must be derated linearly from 50°C to 71°C, to a value of 40% at 71°C, see Fig. 2.

STORAGE TEMPERATURE RANGE: −25° to +75°C.

ISOLATION (at 20°C ambient temperature and 65% relative humidity):

Between input and output terminals: 2.5kV a-c for 1 minute

Between input and chassis: 2.5kV a-c for 1 minute

Between output terminals and chassis: 500V d-c, 100 megohms minimum..

VIBRATION: 5–10 Hz, 10 mm amplitude, 3 axes.
10–55 Hz, 2 g, 3 axes.

SHOCK: 20 g, 3 axes 11 ±5 msec. pulse duration.

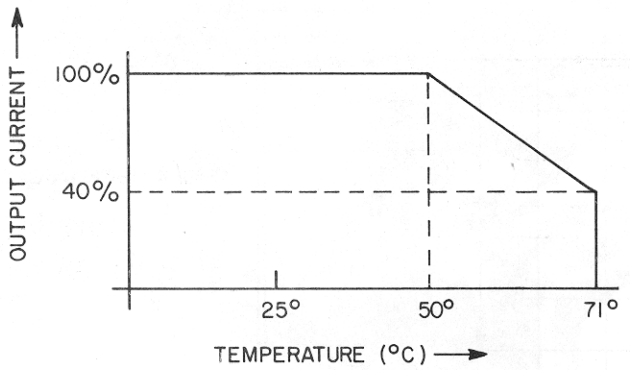


FIG. 2 DERATING GRAPH:
USE FOR OPERATION FROM
50-71°C ambient temperature.

III-OPERATION

INPUT SOURCE VOLTAGE SELECTION (See Fig. 3): The power supply is delivered for operation on 100—130V a-c power lines (wire jumper in the "115V" position). For operation on 200—260V a-c power lines, change the wire jumper to the "230V" position.

FUSE CHANGE (See Fig. 3): All fuses are located on the printed circuit board and are clearly marked with fuse number and value. The relationship between the outputs and their fuse number is shown in the small tables accompanying the views of the terminal sides of the OLD and NEW printed circuit boards.

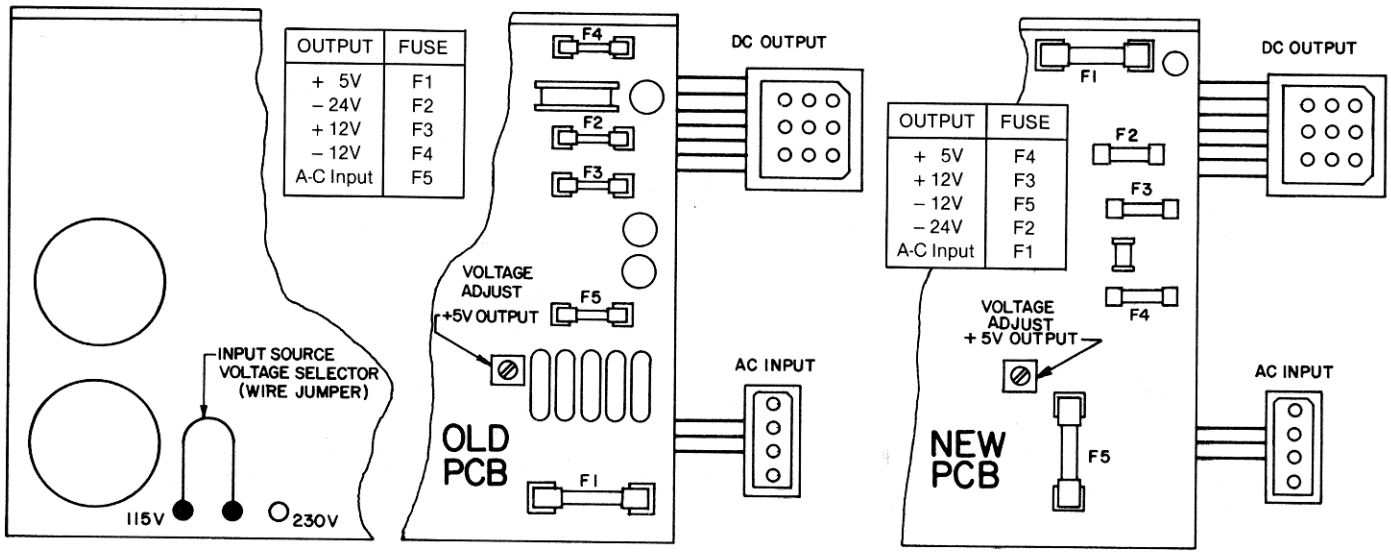
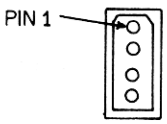


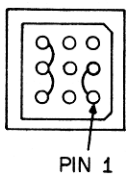
FIG. 3 EFX 050T-1-21037 POWER SUPPLY, SIMPLIFIED TOP-VIEW

CONNECTOR DETAIL:
(WIRING SIDE SHOWN)



PIN #	FUNCTION
1	AC-HOT
2	GROUND
3	N.C.
4	AC-NEUT

4 PIN MOLEX MALE, #03-09-2041
MATES WITH:
4 PIN MOLEX FEMALE #03-09-1041



PIN #	FUNCTION
1,2	+ 5V OUTPUT
3	– 12V OUTPUT
4	0V (+ 5V COMMON)
5	0V (COMMON)
6	– 24V OUTPUT
7,8,9	+ 12V OUTPUT

9 PIN MOLEX FEMALE #03-09-1094
MATES WITH:
9 PIN MOLEX MALE #03-09-2091

INSTALLATION: The power supply may be mounted in any position. Mounting holes are provided as indicated in Fig. 4. Care should be taken that the air immediately surrounding the power supply does not exceed the specified ambient temperature value. Cooler power supply operation can often be achieved by careful selection of the mounting surface.

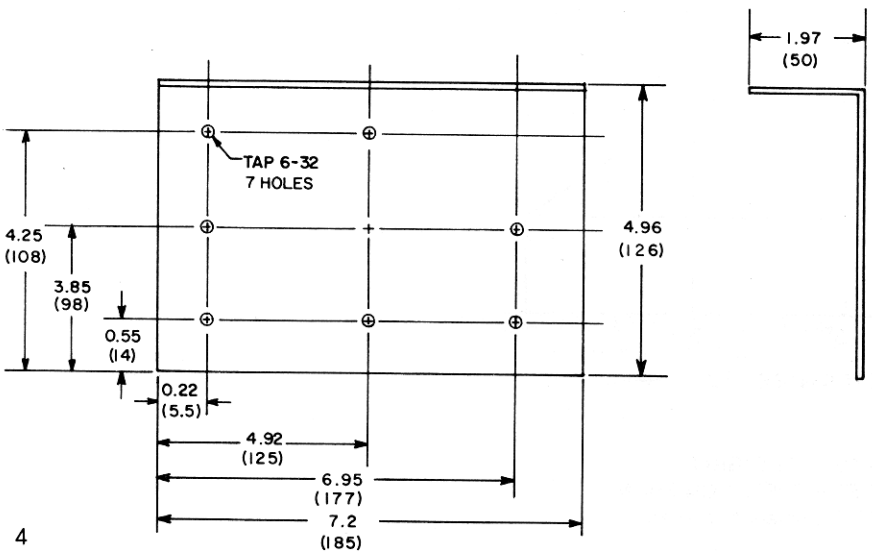


FIG. 4 MECHANICAL OUTLINE DRAWING.

Notes: 1) Dimensions within parentheses are in millimeters.
2) TOLERANCES: 0.02" **(0.5 mm)** between mounting holes, 0.04" **(1.0 mm)** other dimensions.

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