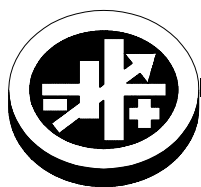


# INSTRUCTION MANUAL



KEPCO An ISO 9001 Company.



## KEPCO SINGLE OUTPUT 150 WATT HIGH FREQUENCY SWITCHING POWER SUPPLIES

### I — INTRODUCTION

The Kepco FAW 150 Watt Series low profile high frequency switching power supplies employ forward conversion and operate with a 78% efficiency with either a-c or d-c input. A resistor and thyristor soft-start circuit limits start-up surge. Surface mount technology permits efficient component layout for minimum mounting space. Six models may be selected for outputs of 5, 12, 15, 24, 28, or 48V. "POWER OK" logic and a green "POWER OK" LED are provided. A steel cover (Model CA 28) is available as an option. Output voltage may be adjusted with a trimmer accessible near the input-output terminal strip (R65, see Figure 4, View "A"). When the input is cut off, the output is maintained for 15 milliseconds minimum. If the power supply shuts down, it is then necessary to wait 90 seconds minimum (120V a-c input) or 120 seconds minimum (240V a-c input) before reconnecting the a-c input power to turn on the unit again. EMI filtering meets FCC Class B (100 to 120 Volts) rating and VDE 0871 Class B (220 to 240 Volts) rating. This page contains specifications for each model of the FAW 150 Watt Series. Environmental specifications for each model are the same.

### II — SPECIFICATIONS

The following specifications apply to FAW 150 Watt Series models. Other FAW Series models are also available; consult your Kepco representative for their specifications.

**TABLE 1. OUTPUT RATINGS AND SPECIFICATIONS, FAW 150W SERIES**

MODEL		FAW 5-30K	FAW 12-12K	FAW 15-10K	FAW 24-6K	FAW28-5K	FAW 48-2.8K
OUTPUT VOLTS, d-c (NOMINAL)		5V	12V	15V	24V	28V	48V
ADJUSTMENT RANGE		4.5 - 5.5V	10.8 - 13.2V	13.5 - 16.5V	21.6 - 26.4V	25.2 - 30.8V	38.4 - 52.8V
OUTPUT CURRENT (NOMINAL) <sup>(1)</sup>		30A	12A	10A	6A	5A	2.8A
OUTPUT POWER (MAXIMUM) <sup>(2)</sup>		150W	144W	150W	144W	140W	134.4W
RIPPLE AND NOISE (mV p-p) 0-50°C 10-100% LOAD	source (typ)	10	15	15	15	20	20
	source (max)	20	30	40	40	40	40
	switching (typ)	30	35	40	50	60	80
	switching (max)	60	70	80	110	140	220
	spike noise (d-c—50MHz)	<120	<190	<220	<310	<330	<530
OVERVOLTAGE SETTING (25°C, NOM. INPUT)		6.0-6.9V	13.7-15.7V	17.0-19.0V	27.0-30.5V	32.0-35.0	53.5-60.0
OVERCURRENT SETTING (25°C, NOM. INPUT) Rectangular type characteristic		32.0 - 36.0A	13.0 - 15.0A	11.0 - 13.0A	6.3 - 7.5A	5.3 - 6.1A	3.0 - 3.5A

(1) Derates same as Output Power.  
(2) See power derating curve, Figure 1.

#### INPUT:

Voltage: 120V a-c/240V a-c nominal; Range 85-264V a-c; 105-370V d-c (polarity insensitive).  
 Frequency: Nominal 50-60 Hz; Range 47-440Hz (at 440Hz leakage current exceeds UL/VDE safety leakage standards).  
 Current (nominal output at rated load): @120V a-c rms: 3.0A typ., 3.5A max; @240V a-c rms: 1.5A typ., 2.0A max.  
 Initial Turn-on Surge: (one-half of first input cycle): @120V a-c rms, 25A max.; @240V a-c rms, 50A max. When the a-c input power is removed, the soft start circuit requires 30 seconds recovery time before the a-c input power is reconnected.  
 Brownout Voltage: 80V a-c, 97V d-c.  
 Switching Frequency: 120KHz typical, nominal load.

#### STABILIZATION:

Source Effect: Range 85-132V a-c or 170-264V a-c, 1.0% typ.; 2.0% max.  
 Load Effect: Range 10%-100% load, 1.0% typ.; 2.0% max.  
 Temperature Effect: Range 0° to 50°C, 1.0% typ.; 2.0% max.  
 Combined Effect: 2.0% typ.; 4.0% max. (includes source, load, and temperature effects).  
 Time Effect: 0.1% typ.; 0.5% max. (1/2 hr-8 hr at 25°C).

**RECOVERY CHARACTERISTICS:** A step load change from 50% to 100% produces less than  $\pm 4\%$  output excursion. Recovery occurs to within  $\pm 1\%$  of the original setting in  $< 1$  ms ( $t_r$  or  $t_f$  equal to or greater than 50 $\mu$ sec at load change).

**START-UP TIME:** 200 ms. maximum.

**HOLD-UP TIME:** 20 ms. typ. (120V a-c), 15 ms. min (100V a-c).

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**DIELECTRIC STRENGTH:**

Between input and output: 2KV a-c for one minute.  
Between input and output with Y-capacitor removed: 3.0KV a-c for one minute.  
Between input and case (ground): 2.0KV a-c for one minute.

**INSULATION RESISTANCE:** Between input and ground, output and ground, input and output;  
100 Megohms min. (500V d-c).

**LEAKAGE CURRENT**

(UL method, 120V a-c, 50-60Hz, single terminal connection): 0.5 mA maximum.  
(VDE method, 240V a-c, two terminal connection): 0.75 mA maximum.

**SAFETY:** UL 1950 recognized (ambient temperature 40° C maximum); CSA E.B. 1402C Level 3 Certified (FAW 48-2.8K Level 1 Certified); CSA 22.2 No. 234 (M90) Level 3 (FAW 48-2.8K Level 1 Certified [ambient temperature 50° C maximum], IEC 950 Approved by TÜV Rheinland (based on EN 60950/09.87, ambient temperature 50° C max.) - cover removed.

**(+) SENSE, (-) SENSE:** These terminals are provided to compensate for voltage drops in the load connecting wires. The Sense terminals must be connected to their respective (+) and (-) output terminals, either at the load or at the Power Supply output terminals. The connection ensures the most accurate error tracking. Error compensation in the connecting wires is up to 0.25 Volts for the FAW 5-30K model, and up to 0.4 Volts for all other models.

**“POWER OK” SIGNAL OUTPUT:** The unit supplies a “POWER OK” logic 1 signal at CP51 (see Figure 2 and Figure 4, View “A”).

**CONNECTOR TYPES:** Refer to the Mechanical Outline Drawing. The mating connector for CP51 is a Panduit, P/N CT10F22-2: Cover, P/N TC100F-2.

**CONNECTOR KIT:** Kepco furnishes an optional connector kit with the specified connector listed above. The kit may be ordered under Kepco Model Kit P/N 518-0029. The connector is provided with 1 meter length leads for trimming to desired lengths.

**EMI:** Designed to meet FCC Class B (100-120V a-c) and VDE 0871 Class B (220-240V a-c).

**VIBRATION:** (non-operating, one hour on each one of the three axes):  
5-10 Hz, 10 mm amplitude.  
10-55 Hz, 2g acceleration.

**SHOCK:** (non-operating, one-half sinusoidal pulse, three shocks to each axis):  
Acceleration: 20g  
Duration: 11ms  $\pm$ 5ms

**OPERATING TEMPERATURE:** 0 - 71° C (see Figure 1).

**STORAGE TEMPERATURE:** -40°C to +75°C.

**OPERATING AND STORAGE RELATIVE HUMIDITY:** up to 95% (wet bulb temp. <35°C non-condensing).

**MOUNTING SCREW:** No. 4-40 UNC Thread (see Figure 4)

**MAXIMUM SCREW PENETRATION:** 0.197 in. (5mm) max.

**WEIGHT:** 2.65 lbs. (1.2Kg max.), 4.41 lbs. (2.0 Kg max. with cover).

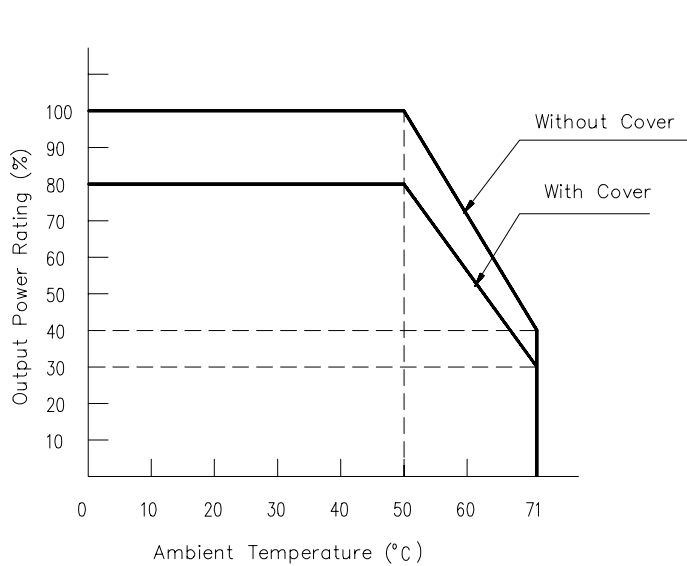
**DIMENSIONS:** 3.74 in. (95mm) H x 2.01 in. (51mm) W x 7.87 in. (200 mm) L

**CASE DIMENSIONS:** 3.74 in. (95mm) H x 2.09 in. (53mm) W x 7.87 in. (200 mm) L

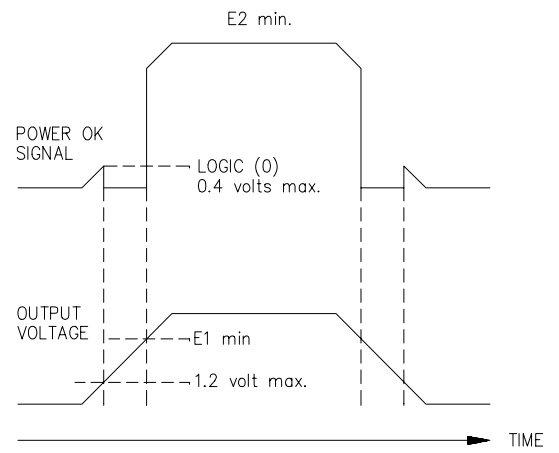
**FRAME MATERIAL:** Aluminum

**FUSE:** Quick acting 6.3A, 250V; (5.2 x 20mm), San-O P/N EQ6.3A; Kepco P/N 541-0113.

**WARRANTY:** 1 year.

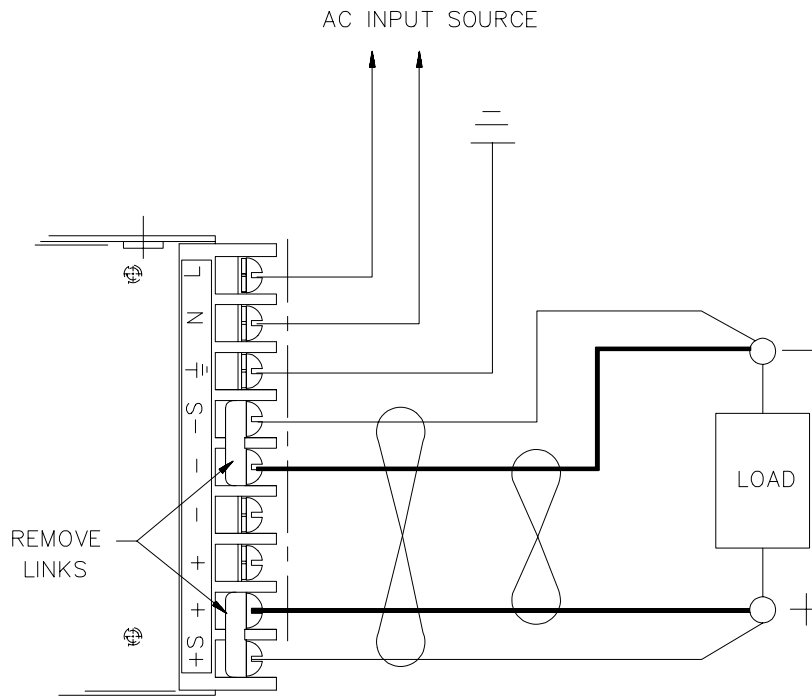


**FIGURE 1. % OUTPUT POWER RATING VS. AMBIENT TEMPERATURE**

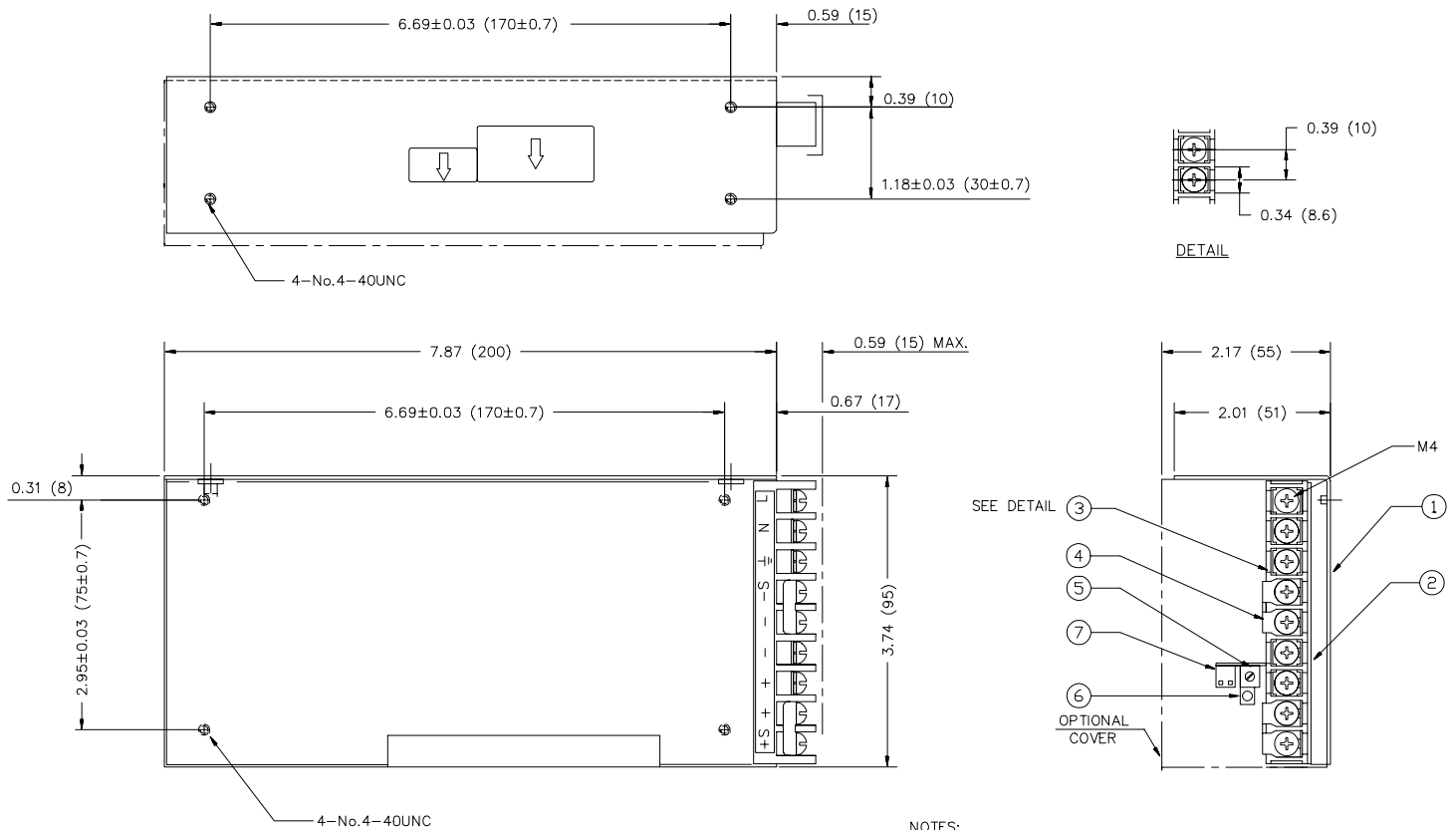


	5V model	12V model	15V model	24V model	28V model	48V model
E1 (min)	4.5V	9.5V	12V	19V	22V	38V
E2 (min)	2.5V	5V	6V	9V	11V	19V
E2 (max)	< OUTPUT VOLTAGE					

**FIGURE 2. "POWER OK" SIGNAL RELATED TO OUTPUT**



**FIGURE 3. LOAD CONNECTIONS WITH ERROR SENSING**



7	POWER OK LOGIC, CP51	1	
6	POWER OK, CR55	1	
5	VOLT. Adj., R65	1	
4	SHORTING LINKS	2	
3	TERMINAL BLOCK	1	
2	P.C.B.	1	
1	FRAME	1	ALUMINUM
NO.	ITEM	QTY.	MATERIAL DESCRIPTION

NOTES:

1. DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS, ALL OTHERS ARE IN INCHES.
2. MAXIMUM PENETRATION OF SCREWS FOR No.4-40UNC MOUNTING HOLES NOT MORE THAN 0.20in (5mm) FROM FRAME SURFACE.
3.  $\pm 0.039$ in ( $\pm 1.0$ mm) TOLERANCE UNLESS OTHERWISE SPECIFIED.

FIGURE 4. MECHANICAL OUTLINE DRAWING