

# INSTRUCTION MANUAL

KEPCO/TDK



**MRW**

## KEPCO MRW 160KV SWITCHING POWER SUPPLY

Kepeco Model MRW 160KV low profile switching power supply is capable of accepting an input voltage range from 95V a-c to 264V a-c without jumpers or adjustment. The d-c output power is shared between three outputs, + 5V, + 12V, and - 12V. Unit features isolated input and output. They are UL recognized and certified to VDE 0806, IEC (DIN) 380, and CSA C22.2 E.B. No. 1402. EMI meets both FCC Class B and VDE 0871 Class B (10KHz-30MHz). The 5V output is provided with overvoltage protection. When voltage across the 5V terminal exceeds the overvoltage limit range of 5.8V-6.9V all outputs are shut down.

The model is self contained on a PC card and all components are within a 1.3-inch profile. A steel cover (Model CA-20) is available as an option. A "POWER OK" signal is accessible through a separate plug terminal. Kepeco supplies an optional mating connector cable kit 219-0184, for all output and input connections.

### OUTPUT SPECIFICATIONS

SPECIFICATIONS	OUTPUT #1	OUTPUT #2	OUTPUT #3	CONDITION
Output Voltage	+ 5V	+ 12V	- 12V	Factory set, nom input <sup>(5)</sup> , typ load <sup>(6)</sup> , 25°C
Initial Setting	5.00V ± 20mV	—	—	120V input: V1 at 2.5A, V2 at 2.0A, V3 at 0.1A
Adjustment <sup>(1)</sup> Range	+ 5% - 3%	—	—	
Output Current Amps (See Fig. 1)	1.0-5.0 (typ) (6.0 max.)	0.6-2.0 (typ) (2.5 max./ 5.0 peak)	0-0.1 (typ) (0.5 max.)	0-50°C
Output power (Watts)	50.0			40°C
	50.0			50°C
	35.0			60°C
	20.0			71°C
Ripple: <sup>(2)</sup> Source	30	30	10	Nominal input, typical load
Switching	50	50	20	
Noise <sup>(2)</sup>	150	290	290	d-c to 20MHz.
Efficiency	72% typ.			Nom input, typ load
Source effect <sup>(3)</sup>	2% max	2% max	1% max	95-132V or 190-264V a-c
Load effect	4% max	2% max	1% max	min-typ load
Cross effect				Load change from minimum to typical; nominal input, 25°C, other outputs at typ load
Output #1	—	4.0% max	1.0% max	
Output #2	1.5% max	—	1.0% max	
Output #3	0.5% max	0.5% max	—	
Temperature effect	2% max	2% max	1% max	Nom input, typ load 0-50°C
Time effect	0.5% max			Nom input, typ load, 25°C, 0.5-8.5 hr drift
Combined effect: source, load & temperature	± 4%	± 5%	± 6%	Initial Setting 5.00V ± 20mV
Recovery characteristics: Excursion	< 4%			Step load change from 50% to 100% of typical load. Nominal input, 25°C
Recovery (within ± 1%)	2 msec max			
Overvoltage protection	5.8-6.9V <sup>(4)</sup>	—	—	
Overcurrent protection <sup>(7)</sup>	Total maximum output power limit 60 Watts			Nominal input, 40°C

(1) Output #2 follows the variation of output #1 (adjustment) (2) mV p-p max. (3) Typical load, 25°C. (4) All outputs are shut down when OVP is activated. (5) Nominal Input: 120V a-c or 230V a-c. (6) Typical load V1 at 5A, V2 at 2A & V3 at 0.1A. (7) Power limiting type.

GENERAL SPECIFICATIONS		
SPECIFICATION	RATING/DESCRIPTION	CONDITION
Temperature	0-71 °C (derate to 40% at + 71 °C)	Operating
	- 40 to 75 °C	Storage
Humidity	95%	Non-condensing operating & storage
Shock:	20g 3 axes (11 msec ± 5 msec pulse duration)	Non-operating 3 shocks each axis
Vibration:	5-10Hz: 10mm 10-55Hz: 2g, 3 axes, 1 hr each.	Non-operating
Isolation	500V d-c, 100MΩ	Output to chassis
Withstand voltage	2KV a-c for 1 min; 3.75KV a-c, 1 min without Y capacitors	Input to output
Dimensions	3.93 x 6.3 x 1.5	inches
	100 x 160 x 38	mm
Weight	17.65/500	ounces/grams
Mounting <sup>(1)</sup>	See outline dimensional drawing	
Safety	UL 478 Recognized, CSA C22.2 certified. VDE 0806/IEC 380 Certified by TUV Rheinland	
Enclosure	Optional metal (see outline dimensional drawing)	
Type of construction	PC card	
Warranty	Used withing ratings	1 year

<sup>(1)</sup> MRW 160KV (uncased) has the same footprint, mounting holes and input-output plug pattern as Kepco Models MRM 144KV and MRW 150KV

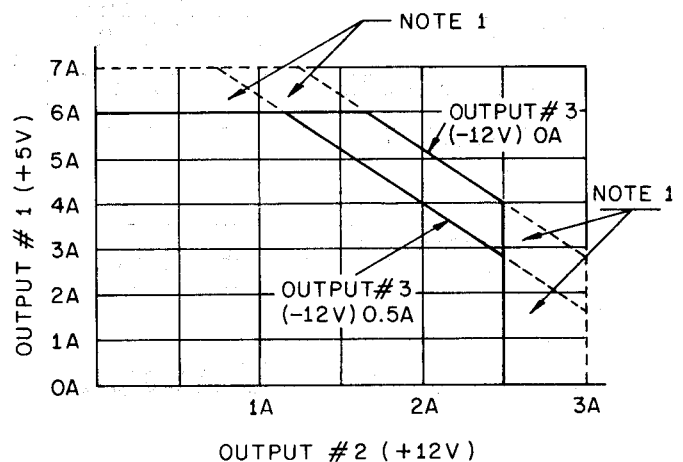
**Determining available power from each output:** Total output power available from the Model MRW 160KV is 50 Watts at temperatures up to 50 °C. The load is distributed to each output. Each output has a different maximum value of current that may be drawn.

**NOTE:** In all cases the maximum current from an individual output should not allow the total power to exceed 50 Watts. Use the following chart in Fig. 1 to determine allowable current for each output.

In the chart on the right the vertical scale represents the +5V output (#1) and the horizontal scale represents the +12V (#2) output. One diagonal line is marked for zero load on the -12V output (#3). The other diagonal line represents 0.5A load on the -12V (#3) output.

To find the available current for output #2 with any desired load on #1 and a selected load on #3, locate the desired load for #1 on the vertical scale and move across to the appropriate diagonal. For example, when #1 is loaded with 4 Amp. and #3 is loaded with 0.5 Amp., the available current for #2 will be 2.0 Amp. If #3 is loaded to 0.25 Amp. the available current for #2 increases to 2.25 Amp. The maximum current can be increased as shown in the chart, provided forced air cooling is used.

FIG. 1 OUTPUT RATINGS



NOTE 1: FORCED AIR 20 CMF AT 1 ATMOSPHERE

INPUT CHARACTERISTICS		
SPECIFICATION	RATING/DESCRIPTION	CONDITION
Voltage range	95-264V a-c	
Current	1.0A typ; 1.3A max	115V a-c, typ load
	0.6A typ; 0.8A max	230V a-c, typ load
Frequency	47-63Hz	Single phase
Fuse value	3A	
Switching frequency	~80KHz	Nominal input, typical load
Brownout voltage	85V a-c	Low operating limit
Initial turn-on surge, first ½-cycle	50A peak (max)	115V a-c, rated load
EMI	FCC Class B, VDE 0871 Class B	120V a-c input 220V a-c input
Leakage current	0.5mA (max)	25 °C, 115V a-c (UL method)
	0.75mA (max)	25 °C, 230V a-c (VDE method)
Startup time	500 msec (typ)	25 °C, nominal input, typ load
Holdup time	30 msec (typ)	25 °C, nominal input, typ load
	20 msec (min)	
Circuit type	Flyback	

**“POWER OK” Signal Output:** The unit supplies a “POWER OK” TTL logic 1 signal at CP54 when the 5V output reaches 4.5 Volts or more. Logic 0 is 0.4V max. Logic 1 is 2.5V min.

**Connector types:** Refer to the mechanical outline drawing. Mating connector types for CP51, CP52 and CP53 are as follows:

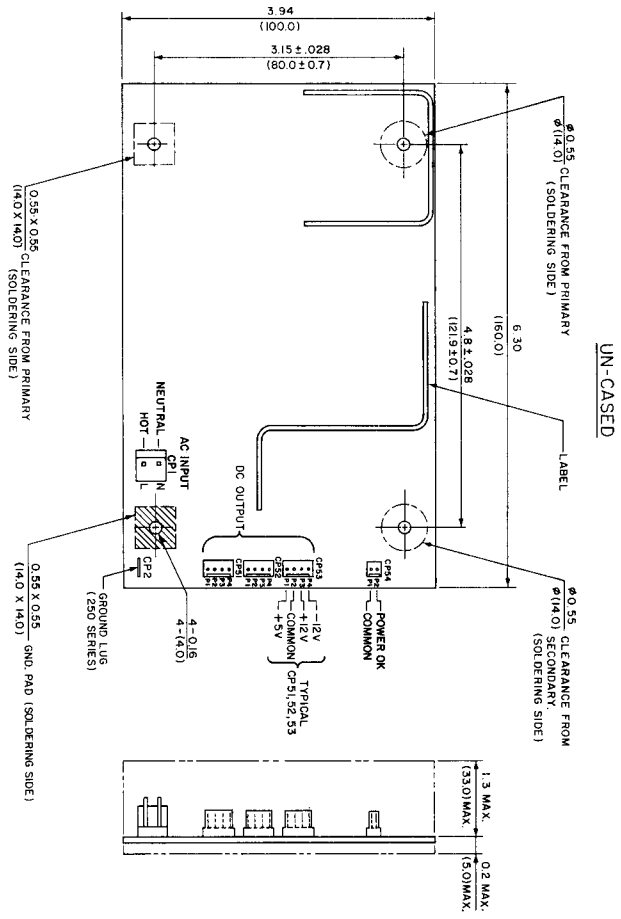
CP51, CP52, CP53, (Output): Mfg. Panduit, P/N CT100F22-4  
Cover: P/N TC100F-4

CP54, (POWER OK), Mfg. Panduit, P/N CT100F22-2  
Cover: P/N TC100F-2

CP1, (Input): Mfg. Panduit, P/N CT156F18-3 Series  
Cover: P/N TC156F-3

CP2, (Ground tab .250” tab): Mfg. AMP. Inc., P/N 42510-2

**Connector Cable Kit:** Kepco furnishes an optional connector cable kit with the specified connectors listed above. The kit may be ordered under KEPKO Model Kit 219-0184. The connectors are provided with 1 meter length leads for trimming to desired lengths.



- NOTES:
1. DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.
  2. SCREWS FOR 8-32 MOUNTING HOLES NOT TO BE SCREWED IN MORE THAN .27(7.0) FROM FRAME SURFACE.
  3. ± 0.04 (± 1) TOLERANCE UNLESS OTHERWISE SPECIFIED.

**MECHANICAL OUTLINE DRAWING**

