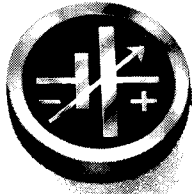


INSTRUCTION MANUAL



KEPCO

ERX

SINGLE OUTPUT SWITCHING POWER SUPPLIES

I-INTRODUCTION

SCOPE OF MANUAL. This instruction manual contains information for the installation and operation of the Kepco ERX-60W Series of Switching Power Supplies. For service information, please refer to the Service Manual for the ERX Series, which can be purchased, either from your Kepco Representative, or by writing directly to: Kepco Inc., 131-38 Sanford Avenue, Flushing, New York, 11352, U.S.A. When ordering a Service Manual, please state **Model Designation and Serial Number of your ERX power supply**. This information can be found on the NAME PLATE of your ERX power supply, as indicated in FIG. 4.

DESCRIPTION. The Kepco ERX-60W Series consists of several models of switching power supplies, having a single output, rated as listed in Table 1.

ERX switching power supplies are of open frame construction and have similar electrical specifications, except for the output ratings as listed in Table 1.

OPTIONAL ENCLOSURE. An optional enclosure, Kepco Model CA-16, is available if the power supply is used in a non-metallic cabinet.

MODEL	ERX 5-12	ERX 12-5	ERX 15-4	ERX 24-2.5	
Output Volts	5V	12V	15V	24V	
OUTPUT CURRENT, AMPERES,	40°C, amb.	12	5	4	2.5
	50°C, amb.	9.6	4.0	3.2	2.0
	60°C, amb.	7.2	3.0	2.4	1.5
	70°C, amb.	4.8	2.0	1.6	1.0
CURRENT LIMIT (Amps)	12.6 ~ 15.6	5.2 ~ 6.5	4.2 ~ 5.2	2.6 ~ 3.3	
OVP SETTING (Volts)	5.8 ~ 6.9	13.7 ~ 15.7	17.0 ~ 19.0	27.0 ~ 30.5	
RIPPLE & NOISE⁽¹⁾ (mV, p-p)					
source (typ)	< 5	< 20	< 20	< 30	
source (max)	< 10	< 40	< 40	< 50	
switching (typ)	< 30	< 40	< 40	< 40	
switching (max)	< 50	< 80	< 80	< 100	
spike noise ⁽²⁾	< 150	< 300	< 300	< 400	

(1) Source component 2x source frequency, and switching component approximately 50 KHz.

(2) Measured with a 50 MHz bandwidth, p-p.

TABLE 1 OUTPUT RATINGS, ERX-60W SERIES

II-SPECIFICATIONS

INPUT VOLTAGE: 85 to 132V a-c or 170 to 264V a-c, (Selectable, see Section III), 47 to 66 Hz, single phase.

BROWNOUT VOLTAGE: 80V a-c/160V a-c. The ERX power supply will function at the brown-out level with minor degradation in the specifications for ripple, stabilization and holding time.

INPUT CURRENT: (Maximum, at full load as specified at the 40°C level in Table 1 and at the minimum input voltage). ERX-60W SERIES: 1.8/0.9A; at 85V a-c/170V a-c input voltage respectively.

INPUT PROTECTION AND SOFT START: All ERX power supplies are protected by a fuse against short circuits in the input circuit. A soft start circuit (thermistor) prevents excessive input surge current at turn on.

INPUT SURGE CURRENT: Turn-on from cold condition at 25°C, <41A at 115V a-c; <82A at 230V a-c.

EFFICIENCY: Typical 72%.

OUTPUT RATINGS: See Table 1.

OUTPUT ADJUSTMENT RANGE: ERX 5-12: +10 – 20%, all other models: +10 – 30% around the nominal output voltage. The location of the output adjustment rheostat is shown in Fig. 2.

OUTPUT STABILIZATION: Refer to Table 2.

INFLUENCE QUANTITY	OUTPUT VARIATIONS	
	Typ.	Max.
SOURCE EFFECT (Min-Max)	<0.6%	1.0%
LOAD EFFECT (10-100%)(¹)	<0.6%	1.0%
TEMPERATURE EFFECT (0-70°C)	<1.0%	2.0%
COMBINED EFFECT (Envelope)	<2.2%	4.0%
TIME EFFECT (drift, 8 hr @ 25°C)	<0.1%	0.5%

(¹) Measured at the (±) sensing terminals.

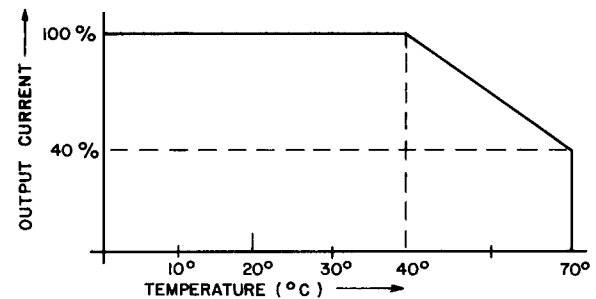


FIG. 1 DERATING GRAPH: USE FOR OPERATION FROM 50-71°C AMBIENT TEMPERATURE.

TABLE 2 OUTPUT STABILIZATION

OUTPUT RECOVERY FROM LOAD CHANGES (ALL OUTPUTS): A step load change from 50 to 100% of the rated load current produces less than 4% output voltage excursion (or 0.5 volt, whichever is greater). Recovery occurs to within 1.0% (or 0.05 volt whichever is greater) of the original output voltage setting in less than 1 millisecond. Step-load rise or fall time must be greater than 50 microseconds.

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: Overvoltage protection is provided by means of a circuit which disconnects the drive for the main switch. The threshold level is set to approximately 1.2 to 1.4 times the rated output voltage.

NOTE: The overvoltage circuit is reset by interrupting the a-c input for approximately 60 seconds.

AMBIENT OPERATING TEMPERATURE RANGE: 0°C to 40°C without derating: For operation to 70°C, output current from all outputs must be derated linearly from 40°C to 70°C, to a value of 40% at 70°C, see Fig. 1.

STORAGE TEMPERATURE RANGE: -20°C to +75°C.

ISOLATION (at 20°C ambient temperature, 85% relative humidity):

- Between input and output terminals: 3750V a-c for 1 minute
- Between input and chassis: 1250V a-c for 1 minute
- Between output terminal and chassis: 500V d-c, 100 megohms.

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).

EMI-CONDUCTED: FCC 20780, Class B, VDE 0871

EMI-RADIATED: VDE 0875/7.71 (Level N), with optional enclosure.

SAFETY: VDE 0806/IEC 380 approved. UL 478 recognized, CSA 22.2-154 certified.

III-OPERATION

INPUT SOURCE VOLTAGE SELECTION (See Fig. 2): The ERX power supply is delivered for operation on 85-132V a-c power lines (wire jumper in the "115V" position). For operation on 170-264V a-c power lines, change the wire jumper to the "230V" position.

FUSE CHANGE: Since a dual fuse holder is provided, either the large (1 1/4" x 1/4") size or the smaller (5 x 20 mm) size fuse can be used for replacement. The replacement fuse must conform to the applicable SAFETY specifications listed in SECTION 2. Fuse value: 3.15A-250V.

1 1/4" x 1/4" Replacement Fuse: Kepco P/N 541-0070 or SAN-0 SS2-3.15A, or BUSS Type AGC, or LITTELFUSE Type 3AG.

5 x 20 mm Replacement Fuse: Kepco P/ 541-0074 or NAGASAWA ES3-3150 or BUSS Type GDC.

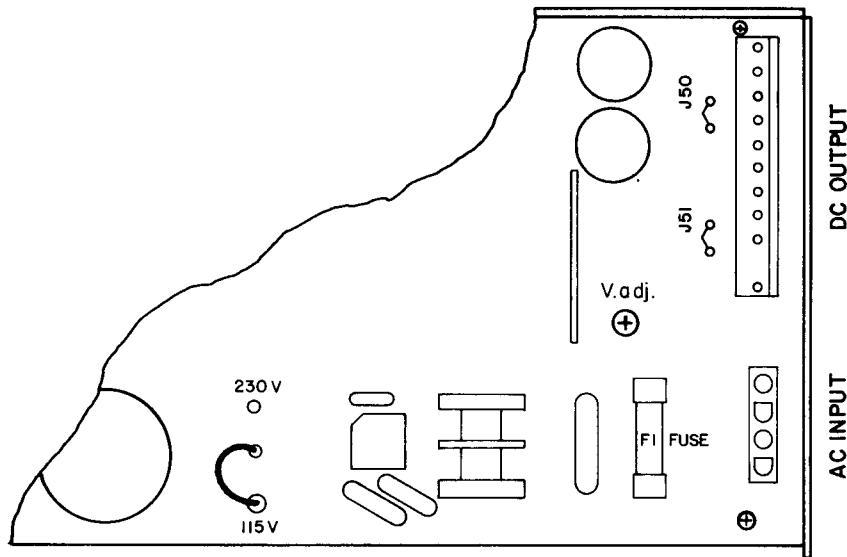


FIG. 2 ERX-60W POWER SUPPLY, SIMPLIFIED TOP-VIEW

LOAD CONNECTION: The load should be connected to the output of the ERX-60W power supply as illustrated in FIG. 3. The mating connector terminals are rated for up to 7A each and accept wire gages 18-28 AWG. If error sensing is used, jumpers J50, J51 must be removed and the indicated pins ($\pm S$) are connected by means of 20AWG wire directly to the load as shown. All other pins (4 for each output side) may be shorted and brought to the load with a heavier wire, or separate wires can be connected for load distribution as required. If error sensing is not used, **do not** use the $\pm S$ terminals for load connection. Error sensing can compensate for voltage drops of up to 0.35 volts in each load connecting wire.

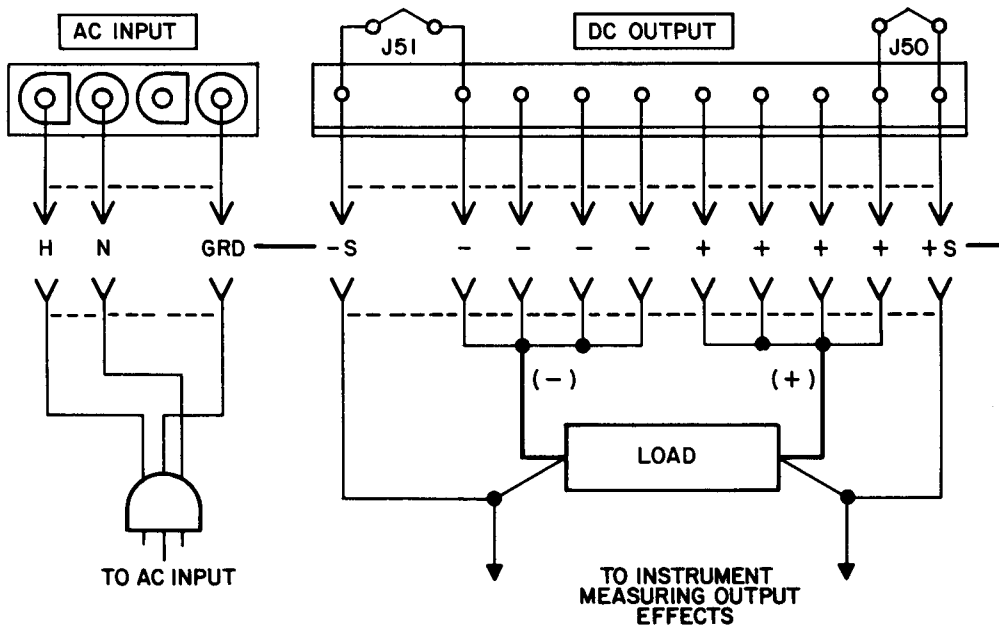


FIG. 3 LOAD CONNECTIONS WITH ERROR SENSING, ERX-60W SERIES.

INSTALLATION: The ERX power supply may be mounted in any position. Mounting holes are provided on two surfaces, 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.

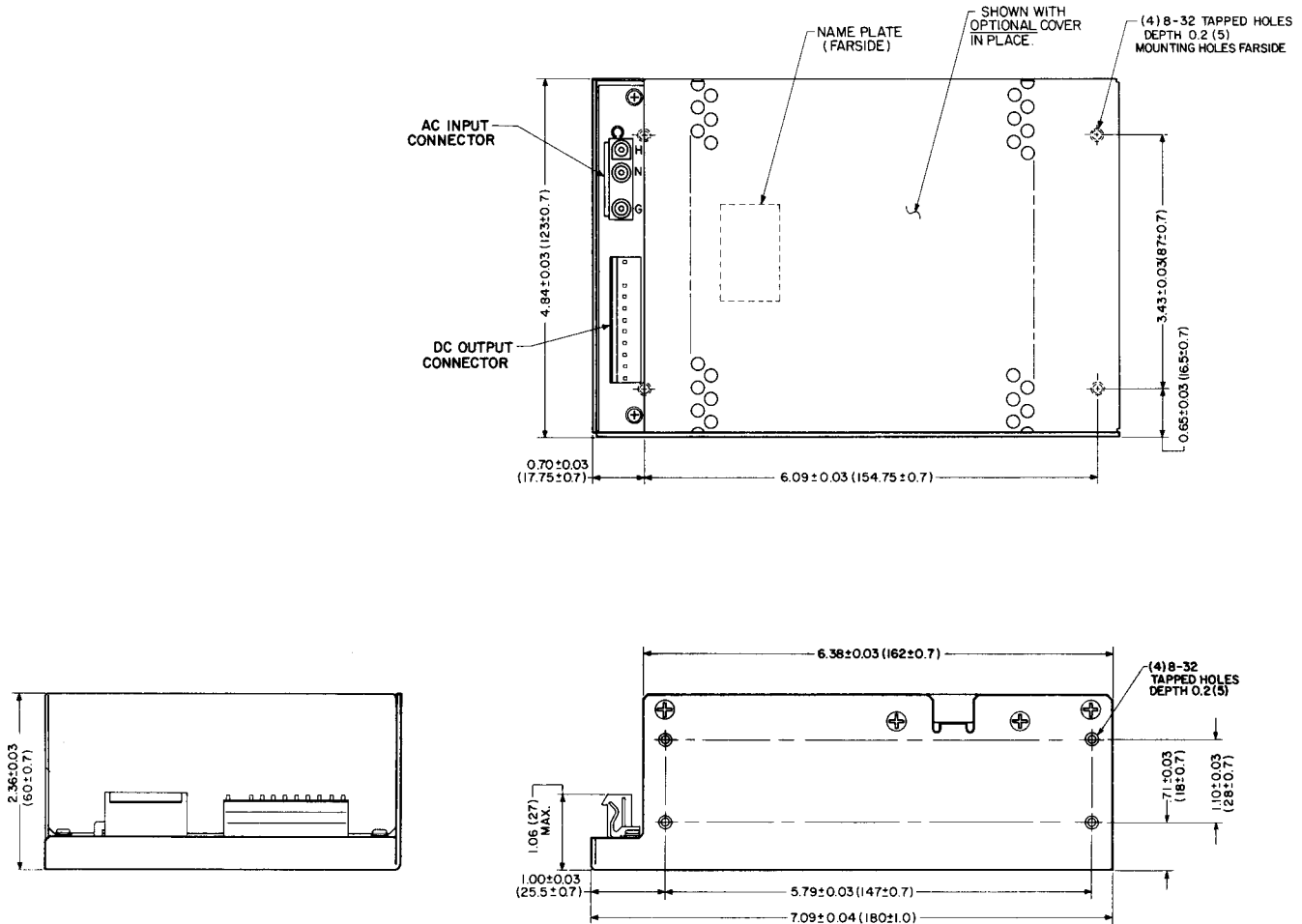


FIG. 4 MECHANICAL OUTLINE DRAWING, ERX-60W SERIES, WITH (OPTIONAL) COVER.

- Notes: 1) Dimensions in parentheses are in millimeters, others are in inches.
 2) TOLERANCES: As noted.
 3) AC INPUT CONNECTOR: Molex 5219-04. MATING CONNECTOR: Molex 3191-04 or equivalent.
 4) DC OUTPUT CONNECTOR: Molex 5277-8A. MATING CONNECTOR: Molex 5196 Series or equivalent.
 5) MATERIAL AND FINISH: A) CHASSIS, aluminum, phosphate treated; B) COVER, CRS, cadmium plated.
 6) WEIGHT: 1.5 lbs (0.7 kg.) max.
 7) A cable-kit, Kepco P/N 219-0145 is available from Kepco Inc. This kit provides input/output terminations for all models in the ERX-60W Series. The kit consists of two cables, one meter long, having the power supply mating connectors on one end and non-terminated wires on the other.