

INSTRUCTION MANUAL



POWER SUPPLIES



Size D-60 Series

Please record the equipment nameplate serial number in the space provided.

Model PRM 240-0.25 (-50)

Serial No.....

GENERAL DESCRIPTION

The Kepco PRM Series 60 Modules are voltage stabilized, multiple tapped output d-c power supplies. Their design is based on Kepco's patented "FLUX-O-TRAN"® ferroresonant transformer, which also provides effective current limiting, thus rendering the power supply completely short-circuit proof. Kepco PRM Series 60 Modules are equipped with an adjustable tap arrangement at the transformer secondary, which permits selection of the output voltage, two increments above, and two increments below the nominal output. The main chassis and wrap-around cover are constructed of aluminum with blue anodized finish.

SPECIFICATIONS, SOURCE INPUT:

- INPUT REQUIREMENTS (Models without suffix): 115V a-c, $\pm 15V$, 60 Hz $\pm 5\%$, single phase.
- INPUT REQUIREMENTS (Models with suffix "-50"): 104V a-c or 115V a-c $\pm 15V$ a-c or 208 a-c $\pm 27V$ a-c or 230V a-c $\pm 30V$ a-c, 50 Hz $\pm 5\%$, single phase.

Kepeco PRM Series 60 Power Supply Modules with suffix "-50" (50 Hz) are shipped for operation on 230V a-c, 50 Hz, single phase lines. The transformer primary connections on these models may be changed for other a-c input voltages, however, by altering the primary jumper connections as shown in FIG. 2.

NOTE: A $\pm 1\%$ change in source frequency produces approximately $\pm 1.5\%$ of output voltage change.

SPECIFICATIONS, D-C OUTPUT a) OUTPUT RATINGS, LOAD EFFECT and RIPPLE:

The size D, Series 60 PRM modules are equipped with an adjustable tap arrangement on the output winding of T1, selecting two increments of voltage above the nominal output and two increments of voltage below the nominal output. In the table of voltages, the nominal (center) tap is indicated by the bold face type. The table of currents has a corresponding bold face column, showing the current rating at the nominal voltage. The two adjacent columns on either side of the nominal current correspond to the respective voltage tap increments. The output load effect is given for the nominal output voltage.

MODEL	OUTPUT VOLTAGE ⁽¹⁾					OUTPUT CURRENT (AMPS)					LOAD EFFECT VOLTS INCREASE		RIPPLE (mV) RMS %
	-B	-A	NOM	+A	+B	-B	-A	NOM	+A	+B	100% LOAD	100% & 20% LOAD	
PRM 5-10	4.2	4.6	5.0	5.4	5.8	12.0	11.0	10.0	9.3	8.6	0.5	0.8	0.50
PRM 5-10-50	4.2	4.6	5.0	5.4	5.8	9.6	8.8	8.0	7.4	6.9	0.5	0.8	0.50
PRM 6.3-8	5.5	5.9	6.3	6.7	7.1	9.1	8.5	8.0	7.5	7.1	0.5	0.8	0.50
PRM 6.3-8-50	5.5	5.9	6.3	6.7	7.1	7.3	6.8	6.4	6.0	5.7	0.5	0.8	0.50
PRM 8-7	7.2	7.6	8.0	8.4	8.8	7.8	7.5	7.0	6.7	6.4	0.6	0.9	0.33
PRM 8-7-50	7.2	7.6	8.0	8.4	8.8	6.2	6.0	5.6	5.4	5.1	0.6	0.9	0.33
PRM 10-6	8.4	9.2	10.0	10.8	11.6	7.1	6.5	6.0	5.6	5.2	0.7	1.0	0.33
PRM 10-6-50	8.4	9.2	10.0	10.8	11.6	5.7	5.2	4.8	4.5	4.2	0.7	1.0	0.33
PRM 12-5	10.4	11.2	12.0	12.8	13.6	5.7	5.4	5.0	4.7	4.5	0.8	1.2	0.33
PRM 12-5-50	10.4	11.2	12.0	12.8	13.6	4.6	4.3	4.0	3.8	3.6	0.8	1.2	0.33
PRM 15-4	13.4	14.2	15.0	15.8	16.6	4.5	4.2	4.0	3.8	3.6	0.9	1.3	0.33
PRM 15-4-50	13.4	14.2	15.0	15.8	16.6	3.6	3.4	3.2	3.0	2.9	0.9	1.3	0.33
PRM 18-3.3	16.4	17.2	18.0	18.8	19.6	3.6	3.5	3.3	3.2	3.1	1.0	1.5	0.33
PRM 18-3.3-50	16.4	17.2	18.0	18.8	19.6	2.9	2.8	2.6	2.6	2.5	1.0	1.5	0.33
PRM 21-2.9	17.9	19.4	21.0	22.6	24.2	3.4	3.1	2.9	2.7	2.6	1.1	1.7	0.33
PRM 21-2.9-50	17.9	19.4	21.0	22.6	24.2	2.7	2.5	2.3	2.2	2.1	1.1	1.7	0.33
PRM 26-2.3	22.0	24.0	26.0	28.0	30.0	2.7	2.5	2.3	2.1	2.0	1.3	2.1	0.33
PRM 26-2.3-50	22.0	24.0	26.0	28.0	30.0	2.2	2.0	1.8	1.7	1.6	1.3	2.1	0.33
PRM 36-1.7	32.0	34.0	36.0	38.0	40.0	1.9	1.8	1.7	1.6	1.5	1.7	2.7	0.33
PRM 36-1.7-50	32.0	34.0	36.0	38.0	40.0	1.5	1.4	1.4	1.3	1.2	1.7	2.7	0.33
PRM 48-1.25	42.0	45.0	48.0	51.0	54.0	1.43	1.33	1.25	1.18	1.11	2.1	3.4	0.33
PRM 48-1.25-50	42.0	45.0	48.0	51.0	54.0	1.14	1.06	1.00	0.94	0.88	2.1	3.4	0.33
PRM 60-1	52.0	56.0	60.0	64.0	68.0	1.15	1.07	1.00	0.94	0.88	1.5	2.7	0.33
PRM 60-1-50	52.0	56.0	60.0	64.0	68.0	0.92	0.86	0.80	0.75	0.70	1.5	2.7	0.33
PRM 70-0.86	80.0	85.0	90.0	95.0	100.0	1.00	0.92	0.86	0.80	0.75	1.8	3.2	0.33
PRM 70-0.86-50	80.0	85.0	90.0	95.0	100.0	0.80	0.74	0.69	0.64	0.60	1.8	3.2	0.33
PRM 90-0.67	80.0	85.0	90.0	95.0	100.0	0.75	0.71	0.67	0.63	0.60	2.2	4.1	0.33
PRM 90-0.67-50	80.0	85.0	90.0	95.0	100.0	0.60	0.57	0.54	0.50	0.48	2.2	4.1	0.33
PRM 120-0.50	110.0	115.0	120.0	125.0	130.0	0.54	0.52	0.50	0.48	0.46	3.0	5.4	0.33
PRM 120-0.50-50	110.0	115.0	120.0	125.0	130.0	0.43	0.42	0.40	0.38	0.37	3.0	5.4	0.33
PRM 160-0.37	140.0	150.0	160.0	170.0	180.0	0.43	0.40	0.37	0.35	0.33	4.0	7.2	0.33
PRM 160-0.37-50	140.0	150.0	160.0	170.0	180.0	0.34	0.32	0.30	0.28	0.26	4.0	7.2	0.33
PRM 240-0.25	220.0	230.0	240.0	250.0	260.0	0.27	0.26	0.25	0.24	0.23	6.0	10.8	0.33
PRM 240-0.25-50	220.0	230.0	240.0	250.0	260.0	0.22	0.21	0.20	0.19	0.18	6.0	10.8	0.33

⁽¹⁾ Measured at 115V a-c source. Models with suffix "-50" measured at 230 V a-c. For custom Volt/Ampere combinations, consult factory.

TABLE 1 OUTPUT SPECIFICATIONS, PRM 60 SERIES.

NOTE: Output voltage accuracy $\pm 2\%$ or 0.25 volts, at nominal source input, full load and 30°C ambient. Initial (cold) output voltage is 1% higher than the table values.

SPECIFICATIONS, CONT'D.

- b) SOURCE EFFECT: Output varies less than $\pm 1\%$ for the rated source voltage range at full load. At no load, the source effect is $\pm 1.5\%$ maximum.
- c) TIME EFFECT (8-hour drift): Less than 1% or 0.1V, whichever is greater.
- d) TEMPERATURE EFFECT (coefficient): Less than 0.05% per °C.
- e) DYNAMICS:
 - 1) VOLTAGE RECOVERY: The time required for the stabilized output voltage to recover within the load effect band, following a 50% to 100% load step, is less than 400 milliseconds.
 - 2) OUTPUT IMPEDANCE: The output impedance from d-c to 10 KHz is a function of the load effect:

$$Z_o = \Delta E_o / \Delta I_o$$

where ΔE_o is the change in output voltage for a given change in load current (ΔI_o). For frequencies **above** 10 KHz, the effect of 0.5 μ H series inductance must be added.

SPECIFICATIONS, GENERAL

- a) OPERATING TEMPERATURE RANGE: -20°C to 55°C . No derating of the specified output current and no external heat sink required.
- b) STORAGE TEMPERATURE RANGE: -40°C to 85°C .
- c) ISOLATION: The circuit of the PRM module is isolated from the chassis and from ground. It may be floated up to 600V d-c (peak) off ground. The chassis should be grounded for safety. A common mode current of 50 μ A rms, 500 μ A p-p (at 60 Hz) flows to the ground return of the a-c power source.
- d) SERIES/PARALLEL: PRM modules can be connected in series up to the 600V isolation limit. Identical models can be paralleled for approximately double current (allow for 10% imbalance).
- e) STANDARDS: PRM modules are designed and tested in accord with NEMA standards for stabilized power supplies, d-c output, Publication No. PY-1-1972. All PRM models are recognized by Underwriters Laboratories under the UL Component Recognition Program: UL specifications 114 and 478.
- f) SHIPPING WEIGHT: Approximately 11 lbs. (5.0 Kg.).
- g) CURRENT LIMITING: Automatic current limiting occurs typically 150% of the rated load current at maximum source voltage.

SPECIFICATIONS, MECHANICAL (See "Mechanical Outline Drawing", FIG. 6)

- a) MOUNTING: Three mounting methods are illustrated in the Mechanical Outline Drawing, FIG. 6. The PRM module may also be mounted into a standard (19-inch) instrument rack by means of the following Kepco Rack Adapters:
 - 1) Single-unit Rack Adapter, Kepco Model RA 30-1.
 - 2) Two-unit Rack Adapter, Kepco Model RA 8-2.
 - 3) Three-unit Rack Adapter, Kepco Model 14-3.

TERMINATIONS AND LOAD CONNECTIONS

A-C input and d-c output connections on the PRM Series 60 power supply are terminated at the barrier strip (TB1) as shown in FIG. 1. The barrier strip terminals are rated for 30 amperes and can accommodate wires to AWG #12. Load wires should be as heavy as practicable, as short as possible and should be tightly twisted to avoid noise pick-up problems.

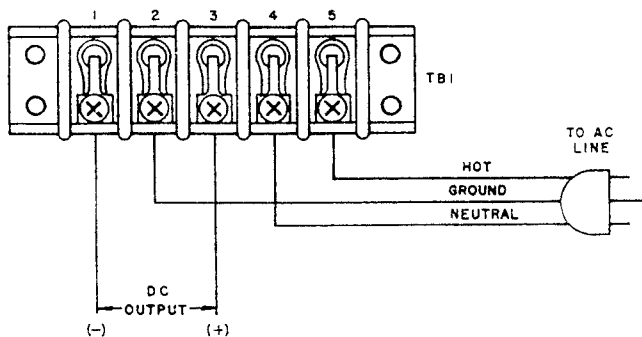
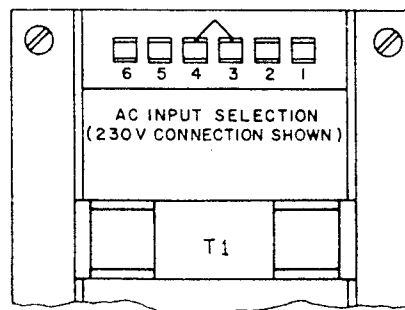


FIG 1 TERMINATIONS AND LOAD CONNECTIONS, PRM SERIES 60.



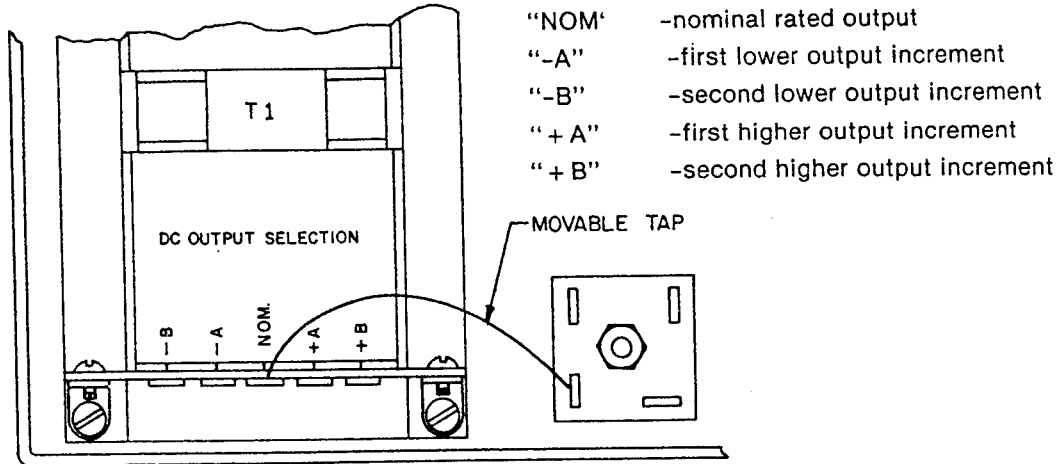
NOTE:

- 104V a-c input: Connect (1)-(2) and (5)-(6).
- 115V a-c input: Connect (2)-(3) and (4)-(5).
- 208V a-c input: Connect (1)-(6).
- 230V a-c input: Connect (3)-(4).

FIG. 2 A-C INPUT SELECTION "--50" SUFFIX.

OUTPUT VOLTAGE SELECTION

Kepeco PRM Series 60 Power Supply Modules are delivered with their outputs set to the nominal rated value. The output voltage can be set two increments above or below the rated value (see Table 1) by removing the a-c input power from the unit and changing the movable tap on the transformer terminal board as shown in FIG. 3. The terminal markings on the selector taps conform with the nomenclature used in Table 1:



NOTE: Table 1 should be consulted for output current ratings when operating from other than the NOMINAL output voltage tap.

FIG. 3 INPUT/OUTPUT VOLTAGE SELECTION.

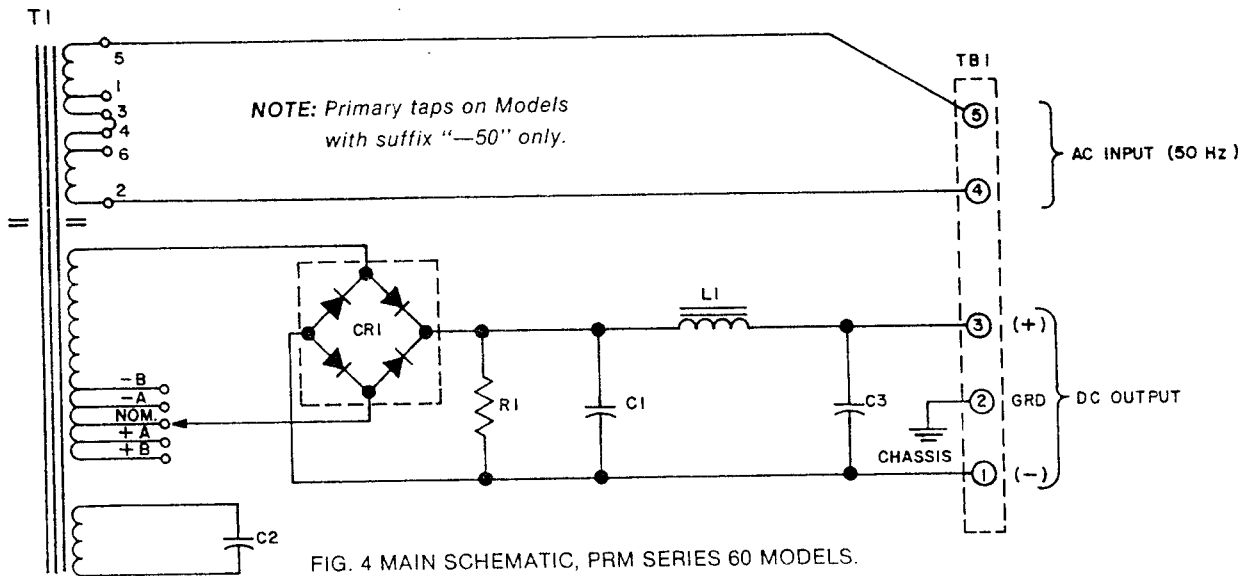


FIG. 4 MAIN SCHEMATIC, PRM SERIES 60 MODELS.

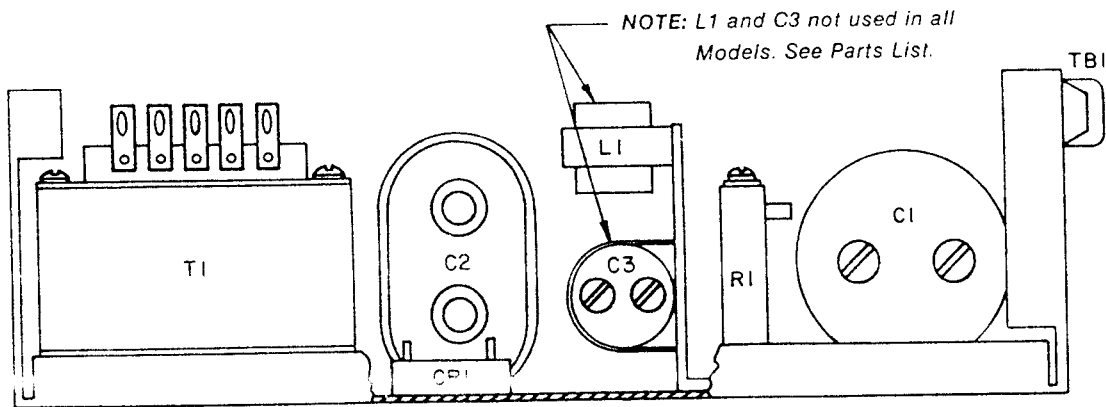
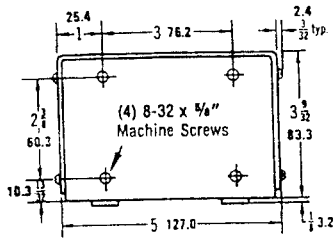
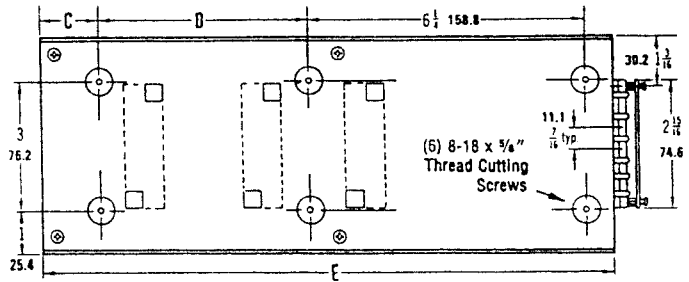
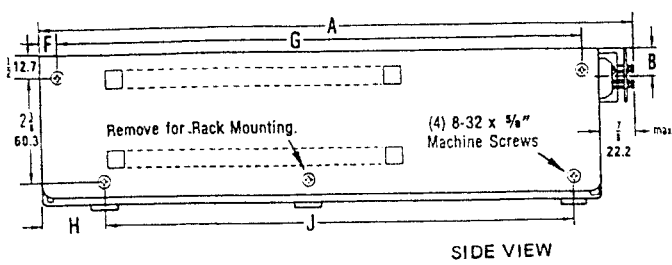


FIG. 5 COMPONENT LOCATION, PRM SERIES 60 MODELS.



END VIEW

SIZE D MODELS (available cased only)

MODELS	A	B	C	D	E	F	G	H	J
PRM SIZE "D"	10 ⁷ / ₁₆	2 ¹ / ₃₂	2 ⁷ / ₁₆	2 ⁵ / ₁₆	10	1 ³ / ₃₂	9 ⁷ / ₁₆	1 ³ / ₁₆	8 ⁹ / ₁₆
	276.2	16.7	20.6	58.7	254.0	10.3	233.4	20.6	217.5

FIG. 6 MECHANICAL OUTLINE DRAWING, PRM 60 SERIES.

Notes:

- 1) MATERIAL: Chassis 0.090 Aluminum. Case, 0.063 Aluminum.
- 2) FINISH: Chassis and Case: Royal blue epoxy paint.
- 3) Fractional Dimensions (Light Face Type) are in inches.
Decimal Dimensions (Bold Face Type) are in millimeters.
- 4) TOLERANCES: ± 1/64 (0.4) between mounting holes.
± 1/32 (0.8) all other dimensions.

MODEL PRM 240-0.25 and PRM 240-0.25-50

REPLACEMENT PARTS LIST

Code 09-3088

REFERENCE DESIGNATION	QTY	DESCRIPTION	MFRS. NAME & PARTS NO. SEE BOTTOM NOTE	KEPCO PART NO.	REC. SPARE PART QTY.
C1	1	Cap., Electrolytic, Can 900 μF, +75 -10%, 300V	Sangamo Type 500	117-0746	1
C2	1	Cap., Paper, Can 3 μF, 6%, 370V	General Electric Type 21L	117-0929	1
CR1	1	Rect., Silicon, Bridge 400V (PIV), 35A	Motorola MDA 3504	124-0533	1
R1	1	Res., Fxd., Power, Tubular 10K ohm, 5%, 20W	Memcor Type FRL20	115-2411	1
T1	1	Transformer, Power Used on PRM240-0.25-50 only	Kepco, Inc. 100-1926	100-1926	1
T1	1	Transformer, Power Used on PRM 240-0.25 only	Kepco, Inc. 100-1847	100-1847	1
TB1	1	Terminal Strip, 5T	Kulka Electric Corp Series 601-Y-5	167-0349	1

NOTE: REPLACEMENT PARTS MAY BE ORDERED FROM KEPCO, INC. ORDERS SHOULD INCLUDE KEPCO PART NUMBER AND DESCRIPTION.

PLEASE NOTE: THE MANUFACTURER'S NAME AND PART NUMBER LISTED FOR EACH ITEM ON REPLACEMENT PARTS LISTS REPRESENTS AT LEAST ONE SOURCE FOR THAT ITEM AND IS LISTED SOLELY FOR THE CONVENIENCE OF KEPCO EQUIPMENT OWNERS IN OBTAINING REPLACEMENT PARTS LOCALLY. WE RESERVE THE RIGHT TO USE EQUIVALENT ITEMS FROM ALTERNATE SOURCES. KEPCO, INC.