

## SECTION 1 - INTRODUCTION

### 1.1 SCOPE OF MANUAL

This manual contains instructions for the installation and operation of the MBT series of 360 Watt (half rack), voltage and current stabilized d-c power supplies manufactured by Kepco, Inc., Flushing, New York, U.S.A.

### 1.2 GENERAL DESCRIPTION

The Kepco MBT Power Supply Series (Figure 1-1) consists of eight single-output models as listed in Table 1-1. All models can be delivered with the following options, indicated as a suffix to the Model Number (see PAR. 1.5):

- M- basic unit
- MG- with single board computer
- MR- with output/polarity reversal relays
- MGR- with single board computer and output/polarity reversal relays

MBT Series Power Supplies are of a stand-alone, bench top design whose half-rack cross section permits mounting in a standard Kepco rack adapter (see Table 1-4). MBT Series Power Supplies can be operated with 115V/230V (switch selectable) nominal a-c input power sources (47 - 63Hz).

MBT Series Power Supplies employ linear stabilization for accuracy and resolution. MBT Power Supplies are full-range, automatic-crossover voltage/current stabilizers with a full rectangular output characteristic. The MBT is controlled digitally with 12 bits of resolution over the entire voltage/current range. Voltage and current are displayed on an alphanumeric LCD display. The operational status of the unit is displayed by five front panel LED's: VOLTAGE MODE, CURRENT MODE, REVERSED POLARITY, REMOTE, and OUTPUT ENABLED. Control of the MBT can either be local (via the front panel controls and keypad) or remote (via the IEEE 1118 communication bus, or for option MG and MGR units, via the RS232C and IEEE 488.2 communication buses).

### 1.3 SPECIFICATIONS

Table 1-1 below indicates parameters that vary for different MBT models; Table 1-2 lists general specifications that apply to all MBT models.

**TABLE 1-1. MODEL PARAMETERS**

MODEL NUMBER	OUTPUT VOLTAGE RANGE (VOLTS)	OUTPUT CURRENT RANGE (AMPS)	MAXIMUM OUTPUT POWER (WATTS)
MBT 6-32M	0-6	0-32	192
MBT 15-20M	0-15	0-20	300
MBT 25-14M	0-25	0-14	350
MBT 36-10M	0-36	0-10	360
MBT 55-7M	0-55	0-7	385
MBT 75-5M	0-75	0-5	375
MBT 100-3.6M	0-100	0-3.6	360
MBT 150-2.4M	0-150	0-2.4	360

**TABLE 1-2. GENERAL SPECIFICATIONS**

CHARACTERISTIC	REQUIREMENT		
INPUT			
A-c Voltage (User selectable)	105-125V/210-250V a-c		
A-c Input Frequency Range	47-63 Hz		
A-c Input Current	115V a-c (nominal)	7.5 Amperes	
	230V a-c (nominal)	3.7 Amperes	
OUTPUT			
Voltage/Current Adjustment Range	0 - 100% of rating, either continuously (inherent resolution), by step or by programmed setting.		
Remote Sensing Range	0.5V per lead		
D-C Isolation Voltage	500V d-c		
Enable/Disable Output Power	Using front panel or via the Digital Bus.		
Polarity Reversal (MR and MGR models only)	Built-in polarity reversal power & sense relays.		
Protection	Overvoltage	Tracks programmed voltage, crowbars output & turns off input circuit breaker.	
	Overcurrent	Tracks programmed current, crowbars output & turns off input circuit breaker.	
	Overtemperature	Monitors heatsink temperature, crowbars output & turns off input circuit breaker.	
	External Polarity Reversal	Built-in diode protects unipolar supply output.	
	Power Loss	Detects loss of a-c input power, disables output & turns off input circuit breaker.	
	Overvoltage or interruption between Power and Sensing Leads	MR and MGR Models:	Output voltage and current programmed to zero and output relays opened.
		M and MG Models:	Output voltage and current programmed to zero and/or output crowbar activated and input circuit breaker turned off
CONTROL-INDICATORS			
Programming Resolution/Accuracy	Voltage Current	Programming Resolution	Accuracy
		0.024% E <sub>OMAX</sub> (12 Bits)	0.024% E <sub>OMAX</sub>
		0.024% I <sub>OMAX</sub> (12 Bits)	0.1% I <sub>OMAX</sub>
Data Read-back Accuracy	Voltage	0.1% E <sub>OMAX</sub>	
	Current	0.15% I <sub>OMAX</sub>	
Output Display	2X16 Char. Alphanumeric LCD with LED Backlight Indicates Output Voltage, Output Current, Status and Menu. Output voltage displayed by four digits with either three, two, or one decimal(s), depending on Model; output current displayed by either three or four digits (depending on Model) with two decimals.		
Indicators (LED)	VOLTAGE MODE	Green; lit when unit is in voltage mode.	
	CURRENT MODE	Amber; lit when unit is in current mode.	
	POLARITY REVERSED	Red; lit when polarity reversed. (Operational for MR and MGR Models only.)	
	REMOTE	Green; lit when unit is operating in remote mode.	
	OUTPUT ENABLED	Green; lit when output is enabled.	

**TABLE 1-2. GENERAL SPECIFICATIONS (CONTINUED)**

CHARACTERISTIC	REQUIREMENT	
STATIC		
Source Effect	Voltage	0.001% E <sub>OMAX</sub>
	Current	0.005% I <sub>OMAX</sub>
Load Effect	Voltage	0.002% E <sub>OMAX</sub>
	Current	0.024% I <sub>OMAX</sub> or 4mA (whichever is greater)
Time Effect (8 Hour Drift)	Voltage	0.01% E <sub>OMAX</sub>
	Current	0.02% I <sub>OMAX</sub>
Temperature Coefficient (per °C)	Voltage	0.01% E <sub>OMAX</sub>
	Current	0.02% I <sub>OMAX</sub>
Ripple & Noise (rms/p-p)	Voltage	0.001%/0.01% E <sub>OMAX</sub> or 0.3mV/3mV (whichever is greater)
	Current	0.03%/0.3% I <sub>OMAX</sub>
MISCELLANEOUS		
Series/Parallel Operation	Consult Kepco applications engineering.	
Leakage Current	Common mode current: 5 μA rms or 50 μA p-p @ 115V a-c	
Temperature	Storage	−20 <sup>0</sup> C to +70 <sup>0</sup> C
	Operating	0 <sup>0</sup> C to 50 <sup>0</sup> C
Cooling	Built-in fan, exhausts air to rear.	
D-C Output Terminals	Binding posts; barrier strip for remote sensing and monitor connections.	
Local voltage/current control	Output can be controlled by entering the desired value via front panel keypad or continuously (inherent resolution) adjusted via front panel control knobs.	
Remote Error Sensing	Provision for 4-terminal (Kelvin) connection to load; static drop of up to 0.5V/lead may be compensated.	
Voltage Recovery for a Step Load Current	100 μsec typical, 150 μsec max to recover within 10mV for a 10% to 100% step in rated load current.	
PHYSICAL		
Dimensions	See Figure 1-2.	
Weight (lbs.)	Model M: 35; Models MR, MG: 36; Model MGR:37	
Source Connections	Detachable IEC type 3-wire power entry.	
Load Connections	Binding Post	
Remote Control Signal Connections	IEEE 1118	Two 9-Pin D-type connectors (female) in parallel for input/output daisy chain.
	RS232-C	9-Pin D-type connector (male)
	IEEE 488	24-Pin connector (female)
Sense, Monitor Connections	Barrier strip	

