146-1923

KEPCO'S HIGH VOLTAGE BHK-MG SERIES

FULL HALF

No matter how you rack it, we deliver the power.

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THE POWER SUPPLIER™

SINCE 1946

BHK-MG models are designed for bench or rack mount use with both front and rear output terminals. Two operating modes are available: conventionally filtered (slow mode) for use as a fixed or slowly varied voltage source. In this mode, the output capacitor provides excellent energy storage to support transient loads. A fast mode is also available. In fast mode, the output capacitor is disconnected and the power supply depends on its fast-responding feedback loop to suppress ripple and noise. Fast mode is ideal for operation as a current source or as a rapidly programmed voltage source where the energy storage of a conventional output capacitor would inhibit the output voltage's agility.

Control is either analog or digital. Analog control is based on the idea of an operational amplifier in which the power supply output is programmable from zero to maximum with a 0-10V signal. Digital control is IEEE 488.2 using a built-in interface that supports SCPI. Resolution is 12 bits and controls both voltage and current. A front panel keypad provides local control. Both digital control (local or remote) and analog control can be inputted simultaneously.

The display is an alphanumeric two-line LCD which provides both setting values and actual voltage and current readings.

BHK-MG use a solid state FET-based high voltage output stage.

BHK-MG comply with EN61010-1 safety standard for measurement control and laboratory use equipment and carry the CE mark.

BHK-MG MODEL TABLE

MODEL	d-c OUTPUT RANGE		MAXIMUM OUTPUT POWER	OUTPUT IMPEDANCE SLOW MODE STRAPPING				OUTPUT IMPEDANCE FAST MODE STRAPPING			
				VOLTAGE MODE		CURRENT MODE		VOLTAGE MODE		CURRENT MODE	
	VOLTS	mA (1)	(WATTS)	SERIES R	SERIES L	SHUNT R	SHUNT C	SERIES R	SERIES L	SHUNT R	SHUNT C
40 WATT HALF RACK											
BHK 300-130MG	0-300	0-130	39	0.115Ω	1.5mH	15.4MΩ	6.6μF	0.115Ω	2mH	15.4MΩ	9nF
BHK 500-80MG	0-500	0-80	40	0.313Ω	2.5mH	41.7MΩ	3μF	0.313Ω	3.6mH	41.7MΩ	8nF
BHK 1000-40MG	0-1000	0-40	40	1.25Ω	5mH	166MΩ	.94μF	1.25Ω	6mH	166MΩ	2nF
BHK 2000-20MG	0-2000	0-20	40	5Ω	32mH	666.7MΩ	0.2μF	5Ω	35mH	666.7MΩ	1nF
200 WATT FULL RACK											
BHK 300-0.6MG	0-300	0-600	180	0.025Ω	1.2mH	3.33MΩ	20μF	0.025Ω	2mH	3.33MΩ	.013μF
		0-60	18			33.3MΩ				33.3MΩ	.008μF
BHK 500-0.4MG	0-500	0-400	200	0.0625Ω	2mH	8.3MΩ	10μF	0.0625Ω	3.6mH	8.3MΩ	.012μF
		0-40	20			83MΩ				83MΩ	.007μF
BHK 1000-0.2MG	0-1000	0-200	200	0.25Ω	4mH	33MΩ	4μF	0.25Ω	6mH	33MΩ	.005μF
		0-20	20			333MΩ				333MΩ	.003μF
BHK 2000-0.1MG	0-2000	0-100	200	1Ω	30mH	133MΩ	2μF	1Ω	35mH	133MΩ	.002μF
		0-10	20			1333MΩ				1333MΩ	.001μF

(1) The full rack BHK-MG have 10:1 current ranging. By command selection from the keypad or GPIB, the full 12-bit control resolution is available across 0-10% of the current rating.

Kepco's BHK-MG are high voltage linear voltage-current stabilizers offered in two sizes: a 40 watt half-rack design and a 200 watt full-rack power supply. Outputs range from 0-300 volts to 0-2000 volts. Both digital and analog programming control is featured.

FEATURES

- Two sizes: half-rack 40 watts, full-rack 200 watts.
- FET output stage.
- Conventional filtering or fast response.
- Fast analog programming mode.
- Rapid recovery current mode in fast mode.
- Local control from panel-mounted keypad.
- Built-in GPIB, IEEE 488.2, 12 bits.
- Support for SCPI language.
- 2-line 16 character LCD display.
- Full read back of voltage and current on the bus.
- Increased resolution and accuracy (x10) for reading small current.
- Versatile output on/off port (40W only).
- Extensive protection circuitry.

This KEPCO product is backed by a firm **5-YEAR WARRANTY**

CE BHK-MG are CE marked per the Low Voltage Directive (LVD), EN61010-1 and the EMC Directives.

BHK-MG INPUT CHARACTERISTICS

SPECIFICATIONS		RATING/DESCRIPTION 40W	RATING/DESCRIPTION 200W	CONDITION
a-c Voltage	nominal	115/230V a-c		Single phase, switch selectable
	range	105-125/210-250V a-c		
Frequency	nominal	50/60Hz		
	range	47-63Hz		
Current	115V a-c	1A	<4.0A a-c	At nominal output power
	230V a-c	0.6A	<2.1A a-c	
Withstand Voltage	(All models)	1350V a-c/1 min.		Between shorted inputs and chassis
	300V models	1950V d-c/1 min.		Between shorted outputs and chassis
	500V models	2250V d-c/1 min.		
	1000V models	2800V d-c/1 min.		
	2000V models			
Chassis Connection to Ground Resistance		100 mohms max.		Between ground input connection and chassis @ 30A
Leakage Current		25 µA rms/100 µA p-p, for 115V a-c input voltage(chassis to earth-ground)		

BHK-MG GENERAL (ENVIRONMENTAL) SPECIFICATIONS

SPECIFICATIONS		RATING/DESCRIPTION	CONDITION
Temperature	Operating	0° to +50°C	
	Storage	-20° to +75°C	
Humidity		0 to 95% RH	Non condensing operating & storage
Shock		20g, 11msec ±50% half sine	Non operating, 3-axes 3 shocks each axis
Vibration		5-10Hz 10mm double amplitude	Non operating, 3-axes 1 hour each axis
Cooling		Built-in fan, exhaust air to rear	
Remote Error Sensing (Default state is local sensing)		Provisions for 4-terminal (Kelvin) connections to load	

BHK-MG PHYSICAL CHARACTERISTICS

SPECIFICATIONS		RATING/DESCRIPTION 40W	RATING/DESCRIPTION 200W	CONDITION
Dimensions	English	5.22″ x 8.35″ x 15.9″	5.22″ x 19″ x 15″	Excludes handles, feet and connectors
	Metric	133 x 212 x 404mm	133 x 482.6 x 381mm	
Weight	English	26 lbs.	45 lbs.	Unpacked
	Metric	12 Kg	20 Kg	
a-c source connections	Front	Circuit breaker, 2-pole		
	Rear	Detachable IEC 3-wire type connector interlock switch (200W only)		Interlock switch (200W)/proximity detector (40W) protects rear connections
d-c output terminals	Front	Jacks (2)		±Output
	Rear	Terminal blocks (11 positions)		±Output, ±sense, ground, grounding network, internal capacitor (-)
Control	Local	Digital control using front panel keypad		
	Remote	Digital control using rear panel IEEE 488 bus (24 pin female connector). Analog control using two rear panel terminal strips (10 positions each) for voltage and current.		
Digital display front panel		Voltage, current, mode, status, menu, program		2 x 16 character alphanumeric LCD, LED backlight
Output display		Output voltage is displayed with two decimals for 300 and 500V models and one decimal for 1000 and 2000V models. Output current for 200W (high current scale) and 40W (300V model) is displayed with two decimals. 200W (low current scale) and all other 40W models are displayed with three decimals.		

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BHK-MG OUTPUT CHARACTERISTICS

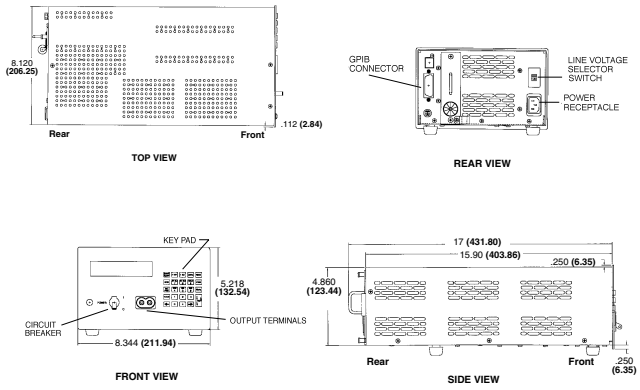
SPECIFICATIONS		RATING/DESCRIPTION	CONDITION
Type of Stabilizer		Linear/automatic crossover	Voltage/Current
Adjustment Range	Voltage	0 to 100% E_o max	Analog or digital, 12 bit
	Current (Source)	0 to 100% I_o max 0 to 10% I_o max (200W models only)	Use menu program to change current scale
	Current (Sink)	50% I_o max (200W) 100% I_o max (40W)	Fixed value not calibrated
Programming Resolution	Voltage	0.025% E_o max	Current measurement requires a calibrated shunt
	Current	0.025% I_o max	
Programming Accuracy	Voltage	<0.025% E_o max	
	Current	<0.05% I_o max	Both current scales (200W models)
Data Readback Accuracy	Voltage	<0.05% E_o max	
	Current	<0.05% I_o max	Both current scales (200W models)
Source Effect	Voltage	<0.001% E_o max	Input voltage 105-125/210-250V a-c
	Current	<0.002% I_o max	
Load Effect	Voltage	<0.005% E_o max	no load-full load
	Current	<0.015% I_o max	short-full load
Temperature Effect	Voltage	<0.01% E_o max	Per °C (0 to 50°C)
	Current	<0.02% I_o max	
Time Effect	Voltage	<0.01% E_o max	0.5-8.5 hours
	Current	<0.02% I_o max (5)	
Ripple/Noise	Fast Mode	0.002%/0.02% E_o max	See Note 6
	Slow Mode	0.001%/0.01% E_o max	
Programming Rise/Fall Time (Fast mode)	Voltage	180 µsec	See Note 1
	Current	200 µsec	
Transient Voltage Recovery Time for Load Change	Fast Mode	1 msec	See Note 2
	Slow Mode	15 msec	
Current	Fast Mode	500 µsec	
Small Signal 3dB Bandwidth	Voltage	2.5KHz	See Note 3
	Current	2.3KHz	See Note 4
Slew Rate of the Output Voltage (Fast mode)	Voltage	>0.015 x E_o max V/µsec	
	Current	>0.03 x E_o max V/µsec	High range
Overshoot		None	Turn ON/OFF
Remote Sensing Range		0.5V d-c per lead	
d-c Isolation Voltage	300V models 500V models 1000V models	1KV d-c or p-p plus max. output voltage	Between each output terminal and chassis
	2000V models	0.5KV d-c or p-p plus max. output voltage	
Enable/Disable Output Power	Local	Front panel keypad	See Note 7
	Remote	IEEE 488 (GPIB) bus	
Output Display		Local 2 x 16 character alphanumeric backlit LCD	
Series Connection		Automatic or master-slave operation, limited by the d-c isolation limit voltage	For slave unit, use analog programming only
Parallel Connection		Automatic or master-slave operation	For slave unit, use analog programming only

OUTLINE DIMENSIONAL DRAWINGS

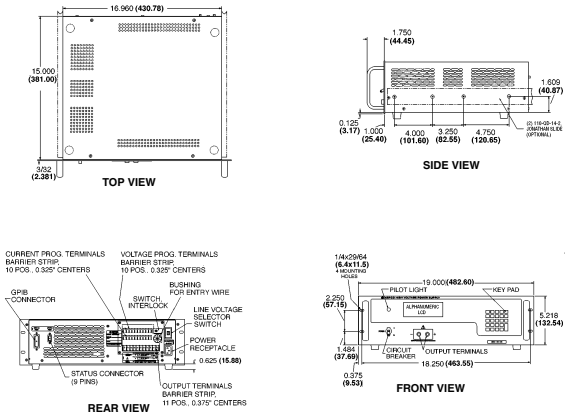
Fractional dimensions in light face type are in inches, **dimensions in bold face type are in millimeters.**

Tolerance: ± 1/64" **(0.4)** between mounting holes, ± 1/32" **(0.8)** other dimensions

BHK-MG HALF-RACK MODELS



BHK-MG FULL-RACK MODELS



Note 1: Load = E_o max / I_o max. V_{out} between 0-$E_o$max.
The programming time is measured between 10% and 90% of E_o max or I_o max.

Note 2: Voltage mode, load switched from open circuit to I_o max. at E_o = 200V. Current mode, load switched from short circuit to 200V at I_o max.

Note 3: For maximum load (E_o max / I_o max) with a d-c bias of 200V set by the keypad and an analog input sinusoid = 0.2V rms measured at the analog input terminals.

Note 4: For maximum load (E_o max / I_o max) with a d-c current bias = 200 x Io max / E_o max set by the keypad and an analog input sinusoid = 0.2V rms measured at the analog input terminals.

Note 5: 0.05% for BHK 300-0.6MG.

Note 6: With minus terminal grounded, common mode current does not flow through either the load or the current sensing resistor.

Note 7: 200W models: Acts on digital programming only; 40W models: Versatile output on/off port (digital/relay contacts) acts on both analog and digital programming.

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