

Kepco's EL Series

Fast, Linear Electronic Loads

Ideal 1:1 Replacement of Legacy/Discontinued Loads



Kepco's Series EL Electronic Load provide 1:1 replacement solutions for fielded electronic loads that are hard to find or unavailable.

- Fast Transient Response
- Linear (no switchmode noise)
- Made in the USA
- USA-based support and service

The EL Series is a line of modular air cooled, DC electronic loads,

Power ratings start at 500 Watts per channel up to 80kW; standard models have maximum test capabilities of 50, 200, 400 and 600 volts.

The EL Series offers unique Functional Modularity. Functional Modularity allows the loads to be connected together to increase load power/cur-

rent as required for undefined future applications.

All EL loads are linear designs, meaning no switchmode noise to worry about. They are controlled from either the front panel, analog signals or digitally (USB, RS 232, GPIB, Ethernet). A graphical user interface (GUI) using LabView allows easy programming that allows intuitive use.

SERIES NH 4700 FIELDED MODELS, HIGH CURRENT

Series NH 4700 Fielded Model						Kepco Replacement					
Model No.	Power (kW)	Rack Size (in.)	Height (U)	Voltage (Volts)	Current (Amperes)	Model No.	Power (kW)	Rack Size (in.)	Height (U)	Voltage (Volts)	Current (Amperes)
NH 4700-1	1	19	3	120	200	EL 2K-200-200	2	19	4	200	200
NH 4700-2	2	19	3	120	400	EL 4K-200-500	4	19	4	200	500
NH 4700-3	3	19	6	120	600	EL 5K-200-600	5	19	4	200	600
NH 4700-6	6	19	6	120	1200	EL 10K-200-1200	10	19	8	200	1200
NH 4700-12	12	23	20	120	2400	EL 20K-200-2400	20	19	16	200	2400
NH 4700-18	18	23	24.5	120	3600	EL 30K-200-3600	30	19	24	200	3600
NH 4700-24	24	23	33	120	4800	EL 40K-200-4800	40	19	32	200	4800
NH 4700-36	36	23	45	120	7200	EL 60K-200-7200	60	19	48	200	7200

SERIES NH 4760 FIELDED MODELS, HIGH VOLTAGE

Series NH 4760 Fielded Model						Kepco Replacement					
Model No.	Power (kW)	Rack Size (in.)	Height (U)	Voltage (Volts)	Current (Amperes)	Model No.	Power (kW)	Rack Size (in.)	Height (U)	Voltage (Volts)	Current (Amperes)
NH 4760-1	1	19	3	600	50	EL 2K-600-60	2	19	4	600	60
NH 4760-2	2	19	3	600	100	EL 4K-600-150	4	19	4	600	150
NH 4760-3	3	19	6	600	150	EL 4K-600-150	4	19	4	600	150
NH 4760-6	6	19	6	600	300	EL 8K-600-300	8	19	8	600	300
						EL 10K-600-400	10	19	8	600	400
NH 4760-12	12	23	20	600	600	EL 15K-600-600	15	19	12	600	600
NH 4760-18	18	23	24.5	600	900	EL 25K-600-1000	25	19	20	600	1000
NH 4760-24	24	23	33	600	1200	EL 30K-600-1200	30	19	24	600	1200
NH 4760-36	36	23	45	600	1800	EL 45K-600-1800	45	19	36	600	1800

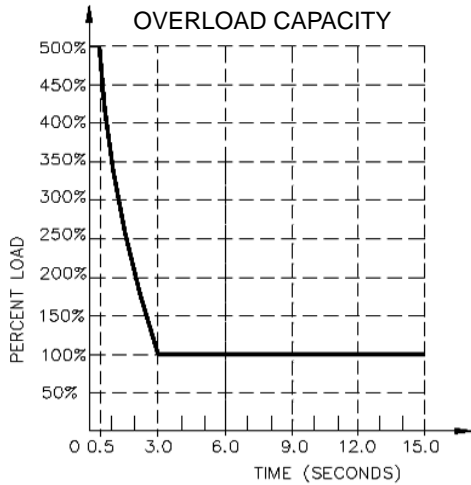
www.kepcopower.com/el.htm

SERIES NH 4300 FIELDLED MODELS

Series NH 4300 Fieldled Model			Kepco Replacement		
Model No.	Voltage (Volts)	Current (Amperes)	Model No.	Voltage (Volts)	Current (Amperes)
NH 4312-150	120	40	EL 1K-200-100D ¹	200	100
NH 4312-300	120	80	EL 1K-200-100D ¹	200	100
NH 4312-600	120	150	EL 2K-200-200D ¹	200	200
NH 4350-150	500	30	EL 1K-600-30D ¹	600	30
NH 4350-300	500	60	EL 2K-600-60D ¹	600	60
NH 4350-600	500	120	EL 4K-600-150 ²	600	150

NOTES:

1. D Suffix: Dual (2 channels max) in 19" x 4U chassis.
2. One channel in 19" x 4U chassis.



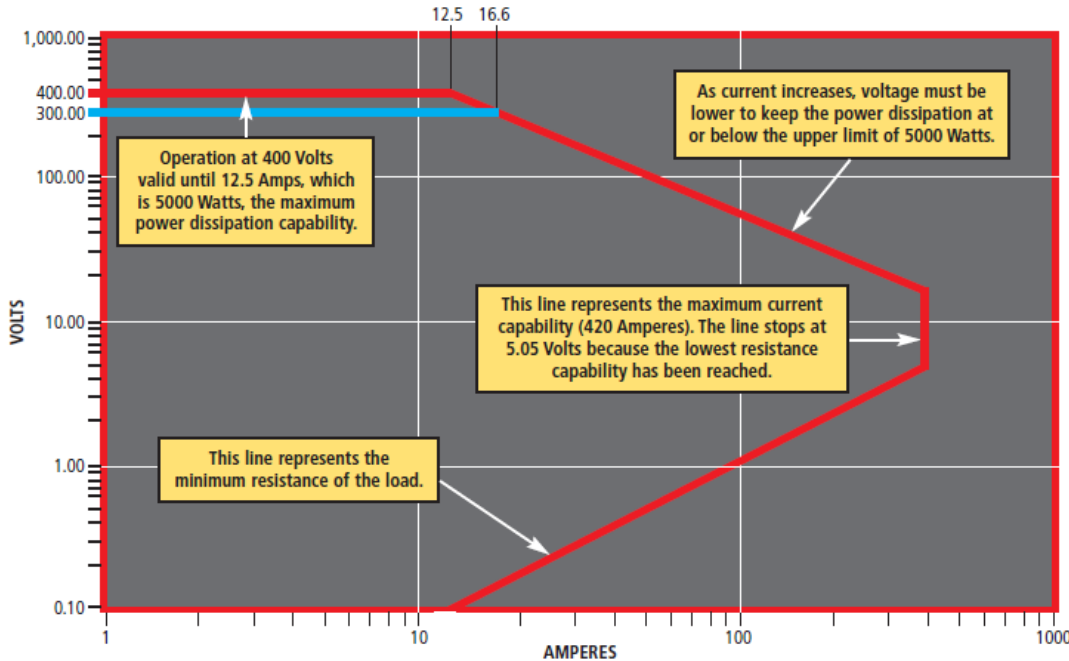
Short term overloads (spikes) from the source being tested may go beyond the rated continuous capacity of the EL load. These short term spikes can be absorbed as illustrated in the Overload Capacity graph shown at the left.

Kepco's EL load features programmable Peak Pulse Power that allows a spike load to be put on the source.

A 60kW configuration. Consists of one 5kW master and 11 5kW slaves.



EXAMPLE OF SAFE OPERATING AREA FOR EL 5K-400-420



The load may be operated at any given input condition that is within the red line boundary.

For example: If a 300 Volt source is to be tested, select the 300 Volt line (blue) and note the range of current allowable along that line.

In this example, the load may be operated at currents from near zero to a maximum of 16.6 Amperes @300V.

APPLICATIONS

RADAR • AUTOMOTIVE - LIFE CYCLE TESTING OF HYBRID CONTROL MODULES • FUEL CELL TEST
 WINDMILL CHARACTERIZATION AND PERFORMANCE TESTING • WEAPONS BATTERY TESTS
 HELICOPTER POWER GENERATOR FLIGHT LINE TEST
 POWER SUPPLY TESTING • HIGH PERFORMANCE BATTERY TEST



EL 30kW

SERIES EL SPECIFICATIONS

SPECIFICATION	RATING/DESCRIPTION ⁽¹⁾	CONDITION	
MODE CHARACTERISTICS			
Linearity vs. Programming Command			
Constant Current Accuracy	±0.25%	5-100% of Full Scale ⁽³⁾	
Constant Power Accuracy	±2%		
Constant Voltage Accuracy	±0.25%		
Constant Resistance Accuracy	±1%		
Constant Conductance Accuracy	±1%		
Regulation ⁽²⁾			
Constant Current	±0.25%	5-100% of Full Scale ⁽³⁾	
Constant Power	±1%		
Constant Voltage	±0.25%		
Constant Resistance	±1%		
Constant Conductance	±1%		
Resolution (Via Computer Control)	14 Bits		
Current Readback (Current Mode)	Computer Accuracy	±0.25%	5-100% of Full Scale ⁽³⁾
	Computer Resolution	±15 Bits	
Parameter Readback (Current and Voltage)	Accuracy	±0.25%	5-100% of Full Scale ⁽³⁾
	Resolution	±15 Bits	
CONTROL CHARACTERISTICS			
USB Interface	Uses IEEE 488.2 and SCPI commands and queries	Requires no cost downloadable driver	
RS 232 Interface		Baud rate: 38400 Parity: None Data Bits: 8 Stop Bits: 1 Echo: OFF	
GPIB Interface		Add suffix "G" to model number for GPIB	
Ethernet Interface		Add suffix "E" to model number for Ethernet	
GENERAL CHARACTERISTICS			
a-c Line Power Input	120-240V a-c (108 to 264V a-c limits) 50-60 Hz, 200 Watts		
Operating Temperature	0°C to 40°C		
Dimensions (Load)	19"W x 7"H x24.5"D		
Weight (Load)	88 lbs.		
Storage Requirements	-20 to +60°C, 15 to 80% RH	Relatively dust free environment	

(1) Specifications measured @ 23°C ambient.

(2) Regulation specified after 15 minutes of operation at set power level.

(3) Accuracy and regulation specifications are valid from 5% to 100% of full scale.
Accuracy is relative to full scale value and not the setpoint.

SERIES EL MODEL TABLE

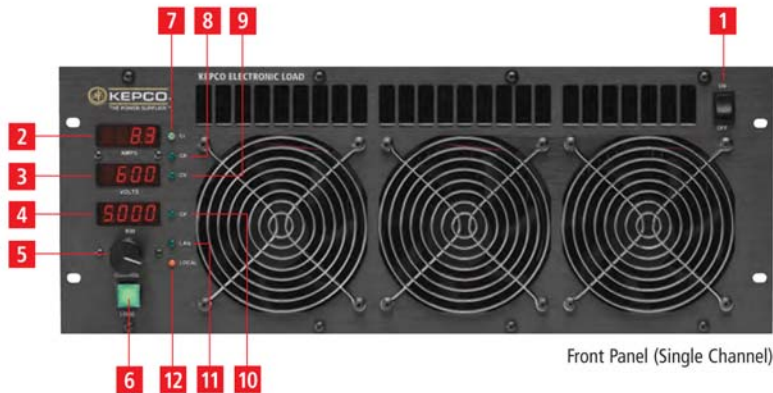
MODEL NUMBER	OPERATING LIMITS			OVERLOAD PROTECTION			MINIMUM ON RESISTANCE ALL MODELS Ohms	INPUT IMPEDANCE Ohms
	RATED POWER Watts	RATED VOLTAGE Volts	RATED CURRENT ALL MODES Amps	POWER Watts	VOLTAGE Volts	CURRENT Amps		
SERIES NH 4700 RECOMMENDED REPLACEMENTS								
EL 2K-200-200	2000	200	200	2100	210	210	0.007	120k
EL 4K-200-500	4000	200	500	4200	210	525	0.003	120k
EL 5K-200-600	5000	200	600	5250	210	630	0.002	120k
EL 10K-200-1200	10000	200	1200	10500	210	1260	0.001	120k
EL 20K-200-2400	20000	200	2400	21000	210	2520	0.0005	120k
EL 30K-200-3600	30000	200	3600	31500	210	3780	0.0003	120k
EL 40K-200-4800	40000	200	4800	42000	210	5040	0.0003	120k
EL 60K-200-7200	60000	200	7200	63000	210	7560	0.0002	120k
SERIES NH 4760 RECOMMENDED REPLACEMENTS								
EL 2K-600-60	2000	600	60	2100	630	63	0.083	160k
EL 4K-600-150	4000	600	150	4200	630	157.5	0.033	160k
EL 8K-600-300	8000	600	300	8400	630	315	0.0165	160k
EL 15K-600-600	15000	600	600	15750	630	630	0.0093	160k
EL 25K-600-1000	25000	600	1000	26250	630	1050	0.0056	160k
EL 30K-600-1200	30000	600	1200	31500	630	1250	0.0047	160k
EL 45K-600-1800	45000	600	1800	47250	630	1830	0.0031	160k
SERIES NH 4300 (120V MODELS) RECOMMENDED REPLACEMENTS								
EL 1K-200-100	1000	200	100	1050	210	105	.00014	120k
EL 2K-200-200	2000	200	200	2100	210	210	0.007	120k
SERIES NH 4300 (600V MODELS) RECOMMENDED REPLACEMENTS								
EL 1K-600-30	1000	600	30	1050	630	31.5	0.017	160k
EL 2K-600-60	2000	600	60	2100	630	63	0.083	160k
EL 4K-600-150	4000	600	150	4200	630	157.5	0.033	160k

EL 30kW-6 channel

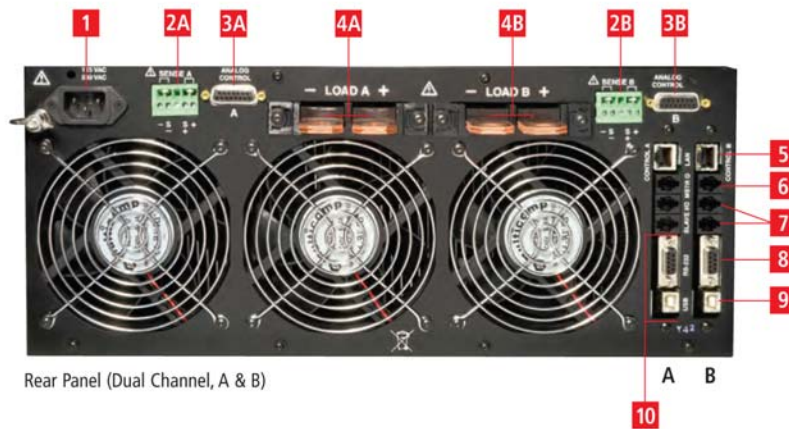


TABLE OF SAMPLE SOFTWARE COMMANDS FROM OVER 1000 IN YOUR SYSTEM

FUNCTION	PURPOSE	COMMAND EXAMPLE
OPERATION MANAGEMENT		
Mode	Selection of operating mode	MODE CURRent, MODE VOLTage, MODE POWer, MODE RESistance, MODE CONDuctance, MODE SHORt, MODE OFF
Load ON/Load OFF	Engage/Disengage load with device under test	INPut 1=ON, INPut 0=OFF
Set Parameter Value	Set current, voltage, power, resistance, conductance values	CURRent xxxx, POWer xxxx
Measure	Measure Voltage, Current, Power	MEASure:CURRent?, MEASure:VOLTage?
Protection	Allows setting maximum parameter values to protect the device under test as needed as well as minimum voltage	VOLTage:PROTEction:UNDer xxxx VOLTage:PROTEction:OVER xxxx
Damping Selection	12 different damping settings to allow optimizing the user's test	SYSTem:PFModule:DAMPing x, SYSTem:DAMPing x Where x is a number from 0 to 5 (min - max)
Transient Operation	To create a transient input change to a new level for a period of time and then return to the original setting. Can also be used to create multiple transients.	CURR:TRAN 10,1,5,8 create 8-5 second transients. Each transient is .1 seconds at 10 amperes then return to original set point for 4.9 seconds.
Ramps	To change the fast response time of the EL (under 50 microseconds) to a period of 100 microseconds to 10 seconds.	SYST:RAMP:1 This is an absolute time of change and not in amperes per second to reduce calculation load on the test software.
SYSTEM MANAGEMENT		
Power FET Modules Installed	List power FET modules installed in EL	SYSTem:PFModule:LIST?
Display Power FET Status	Display FET temperatures, currents and fuse status	SYSTem:PFModule:STATUS?
External Analog Control On/Off	Turn external analog input OFF or to one of two inputs: A high-speed hazardous input or isolated SELV	SYSTem:EXTernal 0 (disabled) SYSTem:EXTernal 1 (hazardous enabled) SYSTem:EXTernal 2 (isolated SELV enabled)



Front Panel (Single Channel)



Rear Panel (Dual Channel, A & B)

FRONT PANEL (SINGLE CHANNEL) CONTROLS AND INDICATORS

1. Power Switch
2. Current Display (Autorange)
3. Voltage Display (Autorange)
4. Power Display (Autorange)
5. Multifunction Control Knob
Press to Select Mode
Turn for Set Point
6. LOAD - Green for Standby
Amber for Engaged
Press to Engage/Disengage
Flashing Red for Fault
7. LED Constant Current Mode (CI)
8. LED Constant Resistance Mode (CR)
Blinks for Constant Conductance Mode (CS)
9. LED Constant Voltage Mode (CV)
10. LED Constant Power Mode (CP)
11. LED LAN (Lit When LAN Connected)
12. LED Local

All Mode LEDs Blinking ON - Short
All Mode LEDs OFF - Mode Off

REAR PANEL (DUAL CHANNEL, A & B) LAYOUT AND CONNECTIONS

1. a-c Input
2. Remote Sense Terminals
3. External Analog Control
4. Laminated Copper Buss LOAD Connection
5. Ethernet Option
6. Master (Out to Slave)
7. Slave Input/Output
8. RS-232 Interface
9. USB Port
10. GPIB Option (Not Shown)

IP address
192.168.1.75

Operating Mode
Disabled

DC AMPERES
0.26

DC VOLTS
0.28

DC POWER
0.0

DC INPUT

STOP

Damping Protection Ramps Transients General Info

Factory Default Damping

System PFM

APPLY

Operation of the EL Load is Convenient and Intuitive with the GUI Soft Panel