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Looking For A High Power, Low Profile Power Supply?

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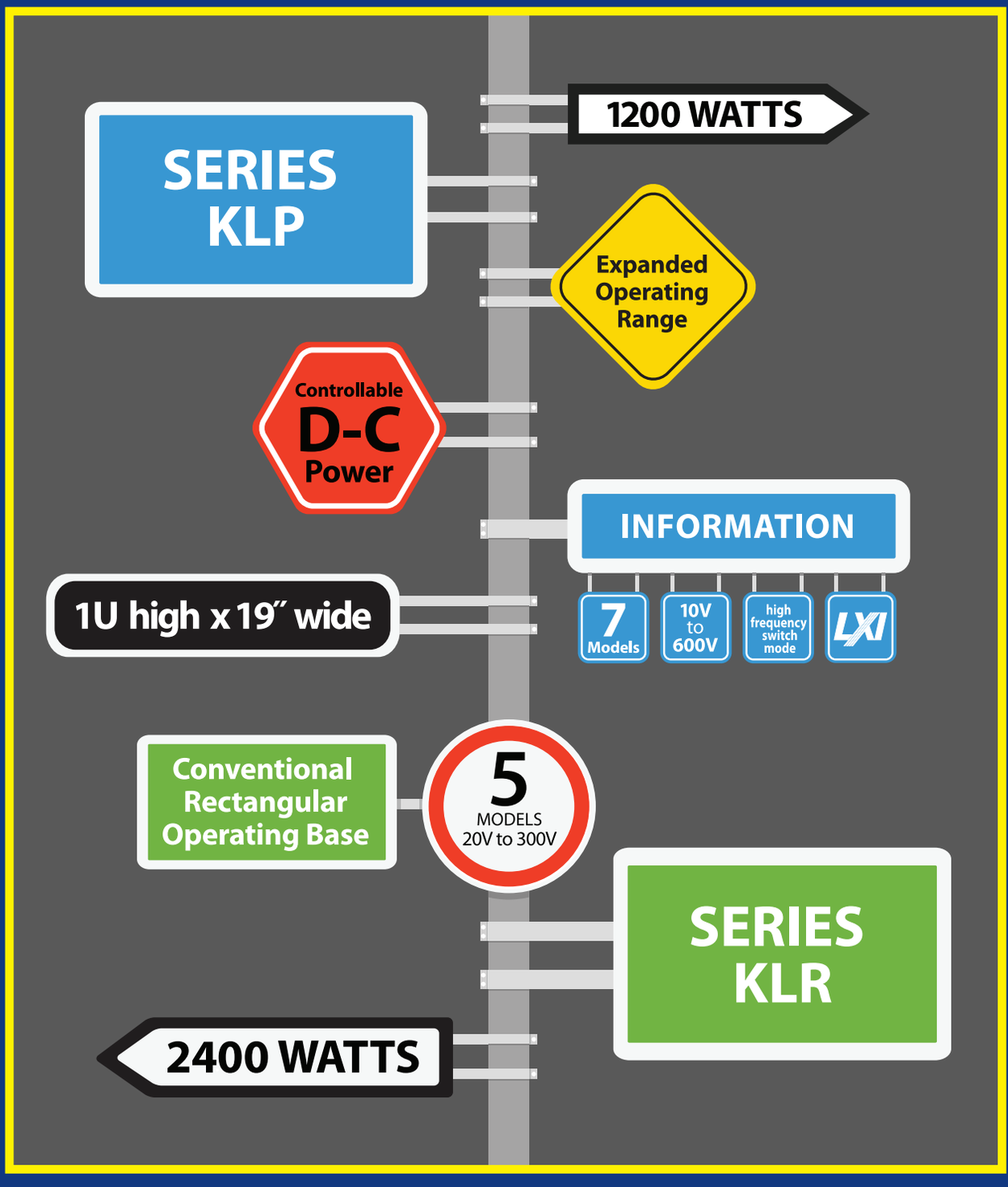


AN ISO 9001 COMPANY

KEPCO®

THE POWER SUPPLIER™

SINCE 1946

KLP MODEL TABLE

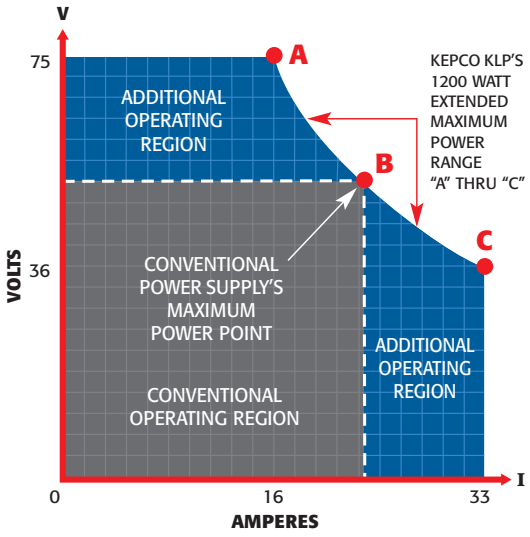
MODEL (3)	RATED VOLTAGE RANGE (1)	MAXIMUM CURRENT FOR RATED VOLTAGE	MINIMUM PROGRAMMABLE CURRENT	RATED CURRENT RANGE (1)	MAXIMUM VOLTAGE FOR RATED CURRENT	RIPPLE AND NOISE (2) p-p	EFFICIENCY @ 115V a-c
KLP 10-150	0-10V	120A@10V	1.9A	0-150A	8V@150A	60 mV	80%
KLP 20-120	0-20V	60A@20V	1.5A	0-120A	10V@120A	60 mV	82%
KLP 36-60	0-36V	33.3A@36V	0.8A	0-60A	20V@60A	60 mV	83%
KLP 75-33	0-75V	16A@75V	0.4A	0-33.3A	36V@33.3A	60 mV	84%
KLP 150-16	0-150V	8A@150V	0.2A	0-16A	75V@16A	125 mV	86%
KLP 300-8	0-300V	4A@300V	0.1A	0-8A	150V@8A	150 mV	87%
KLP 600-4	0-600V	2A@600V	0.05A	0-4A	300V@4A	150 mV	88%

(1) The maximum current and voltage are constrained by the 1200 watt power limitation.
(2) Bandwidth: 20MHz; low frequency ripple may be higher at loads less than 30 Watts.
(3) Standard models (no suffix) include built-in GPIB and RS-232 interfaces.
E-series models (Suffix E) include built-in GPIB and LAN interfaces.

KEPCO SERIES KLP

Using high-frequency switch-mode topology for high efficiency and small size, the KLP provides 1200 watts of well-regulated, controllable d-c power in a 1U (1.75 inch high) by 19 inch rack-mountable package. KLP replaces the need for multiple power supplies by expanding the operating region. The breakthrough of a hyperbolic power limit delivers a full 1200 Watts over an expanded operating range, not just the conventional rectangular operating area.

www.kepcopower.com/klp.htm



KEPCO SERIES KLR

Kepco introduces Series KLR, offering 2400 Watts of stable, controllable d-c power in the industry standard 1U package. Five models from 20 Volts to 300 Volts are available with a conventional rectangular operating area. Input is 180-264V a-c, single phase. GPIB, RS232 and isolated analog programming are all standard.

www.kepcopower.com/klr.htm

KLR MODEL TABLE

MODEL (1)	RATED VOLTAGE RANGE	MINIMUM PROGRAMMABLE CURRENT	RATED CURRENT RANGE	RIPPLE AND NOISE (2) p-p	EFFICIENCY @ 230V a-c
KLR 20-120	0-20V	1.5A	0-120A	100 mV	87%
KLR 40-60	0-40V	0.8A	0-60A	80 mV	88%
KLR 75-32	0-75V	0.4A	0-32A	80 mV	87%
KLR 150-16	0-150V	0.2A	0-16A	100 mV	88%
KLR 300-8	0-300V	0.1A	0-8A	150 mV	89%

(1) Standard models (no suffix) include built-in GPIB and RS-232 interfaces.
E-series models (Suffix E) include built-in GPIB and LAN interfaces.
(2) Bandwidth: 20MHz; low frequency ripple may be higher at loads less than 30 Watts.

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FEATURES

KLP: Provides 1200W output power over a hyperbolic output power envelope, resulting in full output power availability over the range of 8V, 150A to 600V, 2A

KLR: Provides up to 2400W output power via a conventional rectangular output power envelope, resulting in full output power at model limits only

Switch mode topology for cool, efficient operation

GPIB and isolated analog programming included on all models

Standard models have an RS-232 interface

E-Series models replace the RS-232 interface with an Ethernet (RJ-45) connector supporting LAN (LXI certified for KLP)

KLP: 1U panel height at 1200 watts

KLR: 1U panel height at 2400 watts

Front to back air flow allows full power operation without spacers between supplies

KLP: Operates over universal a-c mains voltage range of 90 - 264V a-c with PFC

KLR: Operates over a-c mains voltage range of 180 - 264V a-c with PFC

KLP: Stud-style output power terminals for LV models (10V, 20V, 36V), and Euroblock output power terminals for HV models (75V, 150V, 300V, 600V)

KLR: Stud-style output power terminals for LV models (20V, 40V), and Euroblock output power terminals for HV models (75V, 150V, 300V)

5 YEAR WARRANTY

CE

MARKETS AND APPLICATIONS

- Aerospace and Satellite Test
- Telecom and IT Industry
- Automated Test Equipment
- Factory Automation
- QC Testing
- Burn-in
- Solar
- Water Purification
- Thermal Process Control
- Chemical Processing
- Semiconductor Manufacturing
- Battery Charging and Testing
- Electroplating, Sputtering and Coating
- New Energy R&D

KLP/KLR INPUT SPECIFICATIONS

SPECIFICATION		RATING/DESCRIPTION		CONDITION
		SERIES KLP	SERIES KLR	
a-c Voltage	Nominal	100-240V a-c	200-240V a-c	Single phase
	Range	90-265V a-c	180-265V a-c	Wide range
Input Frequency	Nominal Range	50-60 Hz	50-60 Hz	
	Maximum	45-440 Hz	45-440 Hz	Increased leakage above 66 Hz
Power Factor (PF)	Typical	0.99	0.99	Meets EN 61000-3-2
Maximum Input Current	120V a-c	13A rms	N/A	Rated load (1200W)
	240V a-c	6.5A rms	N/A	Rated load (1200W)
	230V a-c	N/A	12A rms	Rated load (2400W)
Inrush Current	265V a-c	40A	40A	Peak
	132V a-c	20A	N/A	Peak
Input Fusing		Circuit breaker	Circuit breaker	2-line
Low a-c Protection		87V a-c self protected	175V a-c self protected	User-selectable recovery (1)
Output Holdup	Typical	10 milliseconds	5 milliseconds	Ride through
Leakage Current	115V a-c, 60 Hz	1.2mA max	N/A	
	230V a-c, 50 Hz	2.3mA max	2.3mA max	

(1) Either PROTECTED (output disabled and locked until source power recycled) or SAFE (output disabled with unit programmed to last setting; power recycling not needed for recovery) or AUTO (when fault clears, unit automatically recovers to programming setpoints and output state (enabled/disabled) as before fault was detected.

NOTE: Contact Kepco Applications Engineering for d-c input.

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KLP/KLR OUTPUT CHARACTERISTICS

SPECIFICATION		RATING/DESCRIPTION	CONDITION
Stabilizer Type		CV/CC	Voltage/Current
Adjustment Range	Voltage	0-100% of rated voltage	No minimum load required
	Current	min-100% of rated current (1)	
Source Effect	Voltage	0.01% E_{max}	Over full source range
	Current	0.01% I_{max}	
Load Effect	Voltage	0.02% E_{max}	Over full rated load
	Current	0.05% I_{max}	
Temperature Effect	Voltage	0.01%/°C	0-50°C
	Current	0.01%/°C	
Time Effect (drift)	Voltage	0.02%/24hr	After 30 minute warmup
	Current	0.02%/24hr	
Error Sensing		0.25 volts per wire	Above rated output
Isolation Voltage		10-40V: 100V d-c or peak 75-600V: 600V d-c or peak	Either output terminal to ground
Transient Recovery for Load Change	Excursion	1% of E_{max}	50% load step 2A/ microsecond max
	Recovery	2 msec	10% min load, Return to 0.1% of setting
Turnon/turnoff Overshoot		2% max	Rated output, any load
Rise Time	Voltage	10 - 40V: 30 msec 75V: 40 msec 150V: 50 msec 300V: 60 msec 600V: 75 msec	0-E_{max} rated load (resistive)
	Current	10 - 40V: 30 msec 75V: 40 msec 150V: 50 msec 300V: 60 msec 600V: 75 msec	0-I_{max} rated load (resistive)
Fall Time	Voltage No Load (2)	10V: 475 msec 20V: 525 msec 36V: 825 msec 40V: 975 msec 75V: 2820 msec 150V: 4850 msec 300V: 4400 msec 600V: 3150 msec	E_{max}-0, no load (open circuit)
	Voltage Rated Load	10 - 40V: 30 msec 75V: 40 msec 150V: 50 msec 300V: 60 msec 600V: 75 msec	E_{max}-0 rated load (resistive)
	Current	10 - 40V: 30 msec 75V: 40 msec 150V: 50 msec 300V: 60 msec 600V: 75 msec	I_{max}-0 rated load (resistive)
Overvoltage Protection		Programmable 20-120% of E_{max}	User selectable recovery (3)
Overcurrent Protection		Programmable 72-120% of I_{max}	User selectable recovery (3)
Output Load Wire Protection		Shutdown	User selectable recovery (3)
Parallel Operation		Active load sharing within 5% of I_0 rated	Up to 5 units maximum (4)

(1) See Model Table for minimum programmable current.
(2) For improved fall time performance consult factory for "R" (Rapid Output Discharge) option.
(3) Either PROTECTED (output disabled and locked until source power recycled) or SAFE (output disabled with unit programmed to last setting; power recycling not needed for recovery).
(4) E-series are not Master/Slave capable.

KLP/KLR GENERAL SPECIFICATIONS

SPECIFICATION		RATING/DESCRIPTION	CONDITION
Temperature	Operating	-10 to +50°C	Rated load
		+50 to +70°C	Derate current 3% per °C over 50°C
	Storage	-40 to +85°C	
Cooling		3 internal d-c fans	Exhaust to the rear
Humidity		10 to 90% RH	Non-condensing
Shock		20g, 11msec ± 50% half sine	Non-operating
Vibration	5-10Hz	10mm double amplitude	3-axes, non-operating
	10-55 Hz	2g	3-axes, non-operating
Altitude		sea level to 10,000 ft.	0-3,000 ft: 100%, linear derating to 70% of power at 10,000 ft.
Loss of Source Power		Shutdown	User selectable recovery (1)
Overtemperature Protection		Shutdown	User selectable recovery (1)
Fan Failure		Shutdown	Recovery requires power recycling
Withstand Voltage	Input-Chassis	2121V d-c (all models)	25°C, 65% RH
	Output-Chassis	1250V d-c (10V-40V models) 2121V d-c (75V-600V models)	
	Input-Output	2500V d-c (10V-40V models) 4242V d-c (75V-600V models)	

(1) Either PROTECTED (output disabled and locked until source power recycled) or SAFE (output disabled with unit programmed to last setting; power recycling not needed for recovery) or AUTO (when fault clears, unit automatically recovers to programming setpoints and output state (enabled/disabled) as before fault was detected.

KLP/KLR PHYSICAL SPECIFICATIONS

SPECIFICATION		RATING/DESCRIPTION	CONDITION
Weight	English	15 lbs	Shipping: 20 lbs
	Metric	6.82 Kg	Shipping: 9.07 Kg
Dimensions W x H x D	English	19" x 1.735" x 17.5"	Depth excluding connectors and terminal blocks
	Metric	482.6mm x 44.45mm x 443.7mm	
Source Power Connector		IEC 320-C19 appliance inlet	250V a-c, 16A (VDE) 125V a-c, 20A (UL)
Load Connections	10-40V models	Nickel-plated copper busbar with integral threaded stud (1/4-20-1/2in.)	Provision for safety covers
	75-600V models	Shock-safe Euroblock, single conductor size: 20-10 AWG (0,5-5,0 mm^2)	
Analog Programming Port		15 pin D-sub	
Digital Programming Ports	Primary	Standard GPIB connector	IEEE 488.2 (GPIB)
	Secondary	9 pin D-sub	RS 232 (standard models only)
	Secondary	RJ45	LAN (E-Series models only)
Feedback/ Control Input		5 position low profile Euroblocks	

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KLP/KLR PROGRAMMING CHARACTERISTICS - LOCAL

SPECIFICATION		RATING/DESCRIPTION	CONDITION
Local Control		Rotary encoders	Panel mounted
Local Control Resolution	Coarse	~100 LSB/step	Depress control for fine resolution
	Fine	1 LSB/step	
Setting Range		0-100% of rating	KLP will automatically adjust limit to maintain 1200W maximum
Power Up Settings	Voltage	Defaults to zero	Last setpoint values may be saved for voltage and current prior to unit shutdown, and recall them when unit is next turned on
	Current	Defaults to min value	
Protection Limits	Overvoltage	20-120% of E_{max}	Programmable; accessed via front panel protect switch or SCPI command over digital bus
	Overcurrent	72-120% of I_{max}	

KLP/KLR PROGRAMMING CHARACTERISTICS - DIGITAL

SPECIFICATION		RATING/DESCRIPTION	CONDITION
Supported Interfaces	Standard Models	GPIB and RS 232	Supports SCPI command set for GPIB and RS 232
	E-Series Models	GPIB and LAN Support four interfaces for LAN: Web interface, port 80 SCPI Telnet, port 5024 SCPI Sockets, port 5025 VXI 11, port 1024	Support SCPI command set for GPIB and LAN
GPIB		GPIB address range: 1 to 30	Factory default is 6
RS 232	Standard Models Only	Baud rate range: 2400, 4800, 9600, 19,200 or 38,400	Factory default is 38,400
Digital Remote Control	Isolation	Safety Extra Low Voltage (SELV)	
	Format	Compatible with SCPI protocols	W98 SE and later operating systems
Programming Resolution		0.024% of E_{max} and I_{max}	
Programming Accuracy		0.05% of E_{max} and I_{max}	
Readback Resolution		0.024% of E_{max} and I_{max}	
Readback Accuracy		0.1% of E_{max} and I_{max}	
Status Reporting		OVP, OCP, OTP, Output Lead Fault (OLF), fan failure, source power loss	

KLP/KLR PROGRAMMING CHARACTERISTICS - ANALOG

SPECIFICATION		RATING/DESCRIPTION	CONDITION
Analog Remote Control	Selection	Activate with jumper at analog programming connector	Recognized during power up
	Isolation	Safety Extra Low Voltage (SELV)	
Analog Input Update Rate		2Hz (0.5 Second) applies to programming by voltage/resistance and readback specifications	Analog input voltage digitized (12-bit resolution), optically isolated, then processed by digital section
Programming By Voltage	Voltage	0-10V	Voltage equivalent to Full Scale can be reduced by the user
	Current	0-10V	See Model Table for minimum programmable current. Voltage equivalent to Full Scale can be reduced by the user
Programming By Resistance	Voltage	0-10K ohms	Resistance equivalent to Full Scale can be reduced by the user
	Current	0-10K ohms	See Model Table for minimum programmable current. Resistance equivalent to Full Scale can be reduced by the user
Readback		0-10V proportional signal	Proportional to analog control voltage/resistance
Remote inhibit		TTL compatible	Dual polarity, can be active (inhibit the output) for either a TTL high or low
Composite Status Flag		Isolated form C contacts	Programmable. Flags system fault. Additional user selectable flag: a) transition from CV to CC mode or b) transition from CC to CV mode.

RODC

Rapid Output Discharge Circuit Option

The Rapid Output Discharge Circuit (RODC) option (suffix R) is available on all KLP/KLR models. This circuit rapidly discharges the output capacitance, thus significantly reducing response time to reductions in output voltage.

The circuit consists of a voltage detector that compares the programmed and actual values of output voltage. The discharge circuit is activated only when the actual voltage exceeds the programmed value.

Without the RODC circuit, discharge of the total output capacitance (internal and external) is achieved through a combination of the external load resistance and an internal current sink. For high load resistance or open circuit conditions at the output, response time (fall time) can vary from hundreds of milliseconds to seconds depending upon the magnitude of the high-to-low voltage transition.

With the RODC option, output fall time is reduced to approximately the same value as rise time, even with external capacitance equal to 50% of the nominal internal output capacitance.

Please see the website for details about this option.

Visit www.kepcopower.com/klp.htm and www.kepcopower.com/klr.htm for more information

Looking For More High Power, Low Profile Power Supplies?

SERIES KLN

The Kepco Series KLN is a new family of automatic crossover, low-profile, high-performance, low-cost programmable power supplies. The KLN Series offers stable d-c power in a 1U high, half-rack package for 750W, a 1U high, full-rack package for 1500W and a 2U high, full-rack package for 3000W. A total of 39 voltage-current combinations are offered. Output voltages range from 0-6 Volts to 0-600 Volts and output currents range from 0-400 Amps down to 0-1.25 Amps. Speed-controlled fans limit acoustic noise for bench-top applications when full power is not needed.

Precise programming of voltage, current and their limits may be achieved from the front panel, or by analog means or by RS 485 digital control. GPIB or LAN interfaces are factory-installed options.

KLN Series Programmable Power Supply:
750W 1U, Half-Rack (top), 1500W 1U, Full Rack (middle), 3000W 2U, Full Rack (bottom)

For more information visit www.kepcopower.com/kln.htm

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