

LK Series 3 kW Regulated High Voltage DC Power Supplies

40 kV to 100 kV Rack Mount CE Compliant

Power Factor Corrected to > .995 Harmonics Well Below EN61000-3-2

Semi S2-93 Compliant

The LK family of power supplies are sophisticated, 3 kW, high voltage power supplies with low ripple and noise. They are air insulated, fast response units, with tight regulation. They are designed to meet the growing demands from both users and electric utilities for switching supplies with excellent input power factors that draw harmonic currents well below those specified in EN61000-3-2.

The LK Series are fully compliant with the European Harmonized EMI Directive EN50082-2 and with the European Low Voltage (Safety) Directive, 73/23/EEC.



Models from 0 to 40 kV through 0 to 100 kV, 8.75" H x 24.0" D, 55 lbs.

Features:

Power Factor Corrected. Active correction circuitry achieves an input line current harmonic content well below the maximum specified in EN61000-3-2.

Arc Quench. The HV output is inhibited for a short period after each load arc to help extinguish the arc.

Arc Sensing. Internal circuitry constantly senses and integrates arcs that occur over a given time. In the event a system or load arcing problem develops and exceeds factory-set parameters, the power supply will cycle off in an attempt to clear the fault and then automatically restart after a preset "off dwell time".

Pulse-Width Modulation. Off-the-line pulse-width modulation provides high efficiency and a reduced parts count for improved reliability.

Low Ripple. Ripple is less than 0.025% RMS of rated voltage at full load.

Air Insulated. The LK Series features "air" as the primary dielectric medium. No oil or encapsulation is used to impede serviceability or increase weight.

Constant Voltage/Constant Current Operation. Automatic crossover from constant-voltage to constant-current regulation provides protection against overloads, arcs, and short circuits.

Constant Current/Current Trip. A rear panel switch allows selection of either current mode.

Redundant Thermal Overload Protection. Thermostats and fan RPM sensing shut down the power supply due to over temperature or reduced fan speeds.

Tight Regulation. Voltage regulation is better than 0.005% for allowable line variations and 0.01% for allowable load variations. Current regulation is better than 0.1% from short circuit to rated voltage.

Warranty. Standard power supplies are warranted for three years; OEM and modified power supplies are warranted for one year. A formal warranty statement is available



Designing Solutions for High Voltage Power Supply Applications

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Specifications

(Specifications apply from 5% to 100% rated voltage. Operation is guaranteed down to zero voltage with a slight degradation of performance.)

Input: 198 - 264 V RMS, single-phase, 48-63 Hz, 3500 VA maximum at full load. Less than 16 A at 220 VAC. A three position rear terminal block with protective cover is provided.

Efficiency: Typically greater than 85% at full load. Power factor >0.995.

Output: Continuous, stable, adjustment from 0 to rated voltage or current by panel mounted 10-turn potentiometers with 0.05% resolution, or by external 0 to 10 V signals is provided. Voltage accuracy is 0.5% of setting + 0.2% of rated.

Static Voltage Regulation: Better than $\pm 0.005\%$ for specified line variations and 0.01% for no load to full load variations.

Dynamic Voltage Regulation: For load transients from 10% to 99% and 99% to 10%, typical deviation is less than 2% of rated output voltage with recovery to within 1% in 500 μ s and recovery to within 0.1% in 1 ms.

Ripple: Better than 0.025% RMS of rated voltage at full load.

Current Regulation: When in current regulation mode, better than 0.1% from short circuit to rated voltage at any load condition.

When in current trip mode the HV output will disable and latch off when the load current reaches the programmed current level. Reset is accomplished by either cycling the AC power or HV ON/OFF buttons, or by toggling the HV enable signal. A switch located on the rear panel allows the selection of current limit modes: constant current, or current trip.

Voltage Monitor: 0 to +10 V equivalent to 0 to rated voltage. Accuracy, 0.5% reading + 0.2% rated. Impedance is 10 K Ω .

Current Monitor: 0 to +10 V equivalent to 0 to rated current. Accuracy, 1% reading + 0.05% rated. Rev. polarity 1% of reading + 0.1% of rated. Impedance is 10 K Ω .

Stability: 0.01% per hour after 1/2 hour warm-up, 0.05% per 8 hours.

Voltage Rise/Decay Time Constant: 200 ms typical with a 7% resistive load using either HV enable or remote programming control.

Temperature Coefficient: 0.01%/°C.

Ambient Temperature: -20 to +40°C, operating; -40 to +85°C, storage.

Protection: Automatic current regulation protects against all overloads, including arcs and short circuits. Thermal switches and RPM sensing fans protect against thermal overload. Fuses, surge-limiting resistors, and low energy components provide ultimate protection.

Arc Quench: An arc quench feature provides sensing of each load arc and quickly inhibits the HV output for approximately 20 ms after each arc.

Arc Sensing: Internal circuitry senses the number of arcs caused by external load discharges. If the rate of consecutive arcs exceeds approximately one arc per second for five arcs, the supply will turn off for approximately 5 seconds to allow clearance of the fault. After this period the supply will automatically return to the programmed kV value with the rise time constant indicated. If the load fault still exists, the above cycle will repeat.

External Interlock: Open = off, closed = on. Normally latching except for blank front panel version where it is non-latching.

Front Panel Elements. The front panel contains all local control functions. These control functions are: AC power on/off switch and pilot light, separate 10-turn controls with locking vernier dials used to set voltage and current levels, HIGH VOLTAGE ON switch, and HIGH VOLTAGE OFF/RESET switch. LED's indicate when high voltage is on, output polarity, and whether the supply is operating in a voltage or current regulating mode. Output levels are indicated by voltage and current digital meters.

Rear Panel Elements. AC power entry terminal strip, fuses, power on indicator, ground stud, HV output connector, current limit/current trip switch, and remote interface terminal strip.

The signals provided on the remote interface terminal strip are as follows:

- **Inputs:** Safety interlock, output voltage and current program signals, and high voltage enable.
- **Outputs:** Output voltage and current monitor signals, and a +10 V reference source.

Signal common and ground reference terminals are also provided.

Remote HV Enable/Disable:

0 - 1.5 V = OFF,
2.5 - 15 V = ON.

Accessories: Detachable, 8 foot, shielded Dielectric Sciences DS2124 high voltage coaxial cable provided.

Weight: 55 pounds.

Options

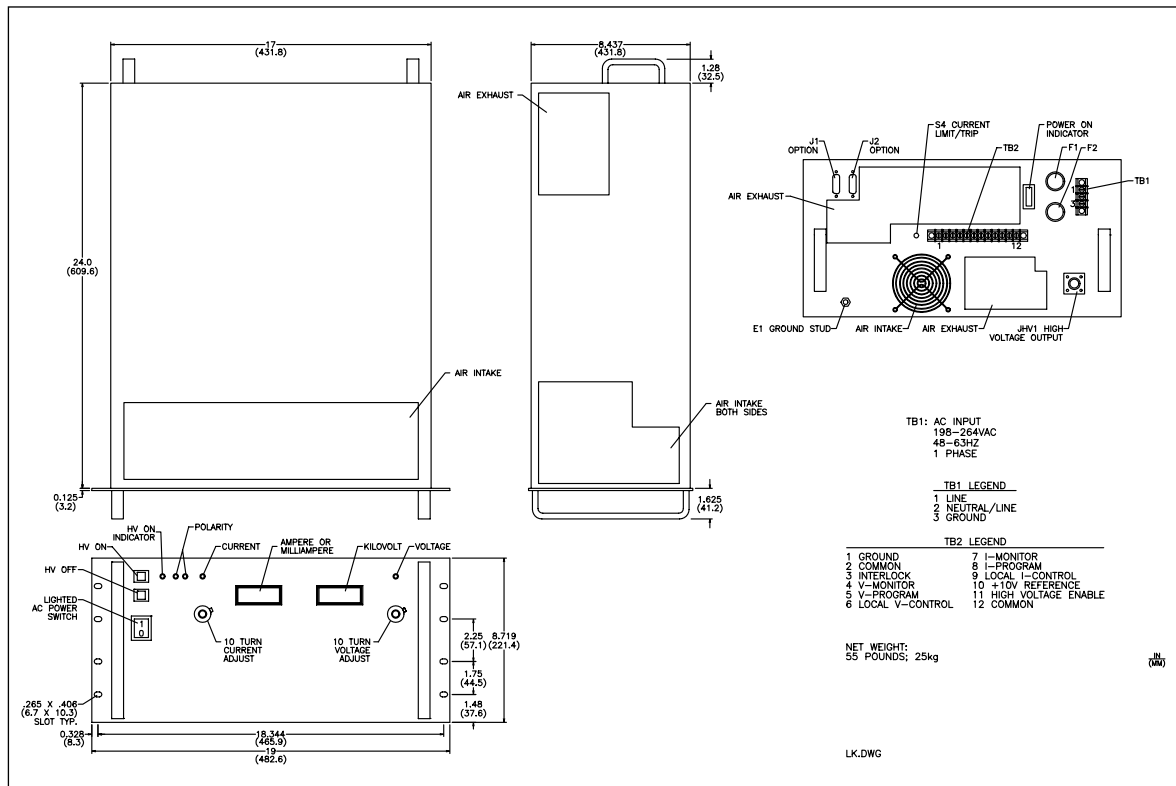
Symbol Description

- 200 180 to 220 VRMS input, 48-63 Hz, derate output current by 10%.
- AM Dual analog panel meters.
- NC Blank front panel, power switch only.
- ZR Zero start interlock. Voltage control, local or remote, must be at zero before HV will enable.
- SS Slow start ramp. Specify standard times of 5, 10, 15, 20, or 30 seconds \pm 20% .
- 5VC 0-5 V voltage and current program/monitor.

Please consult factory for special requirements.

Models

Positive Polarity	Negative Polarity	Reversible Polarity	Output Voltage (kV)	Output Current (mA)	Stored Energy (Joules)
LK40P75	LK40N75	LK40R75	0 - 40	0 - 75	8
LK50P60	LK50N60	LK50R60	0 - 50	0 - 60	10
LK60P50	LK60N50	LK60R50	0 - 60	0 - 50	12
LK70P43	LK70N43	LK70R43	0 - 70	0 - 43	14
LK80P37	LK80N37	LK80R37	0 - 80	0 - 37.5	16
LK100P30	LK100N30	LK100R30	0 - 100	0 - 30	20





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