THE NEW "KG" ISOLATED MODULAR POWER SUPPLY

by Joseph R. Gatley, Sr. Design Engineer

Model KG 25-0.2 was designed and developed to fill the need for a super-regulated isolated modular power supply of Kepco quality. Its voltage and current range of 0-25 volts at 0-0.2 amperes was selected to cover the requirements of most transducer applications. The package is designed for convenient eight-in-a-row rack mounting (5¼" high) to match multiunit installations common in transducer system installations.

Batteries have long been used as isolated power sources in critical applications, but the obvious drawbacks of aging, drift and replacement nuisance, plus the lack of adjustment and means of remote error sensing have caused a shift to more sophisticated hardware.

In order to achieve the required accuracy with modern bridge measurement systems, unusual demands are made on the power supplies. The ideal source for such applications has been described as a zero-impedance battery, suspended in free space. While this ideal will never be realized, a close approximation has been attained in the new Kepco Model KG 25-0.2 Power Source.

The isolation capacitance from output to AC input is called C₁, and is less than 1.0 picofarad in this new model. Capacitance between DC output and ground (C₂) is held to less than 200 picofrads, with a parallel resistance greater than 10,000 megohms. The importance of these parameters will be illustrated in an example given further on.

Regulation, the variation of output versus line and load parameters, is also extremely important in transducer applications. The regulation of Model KG 25-0.2 power supply has been conservatively designed for less than 0.001% output voltage change versus line voltage variation of 105-125V AC, and less than 0.005% output voltage change (or 0.5 mV, whichever is greater) for a load change of 0-200 mA. These specs are typically conservative, and allow a wide margin of safety. Temperature coefficient, another very important parameter, has been given a great deal of attention in this model, to reduce its contribution to variation in output to less than 0.005% per °C. Eight hour stability, the "residual" drift at constant line, load and temperature, is less than 0.005% (or 1.0 mV, whichever is greater).

Continued on Page 3 - Col. 1

ISOLATION TRANSFORMER FOR STRAIN GAUGE POWER SUPPLY

by Arthur Rosin and Franklin Rosenblueth, Kepco Magnetics Division

A power supply for strain gauge operation, imposes a number of unusual requirements on the transformer which powers it. A companion article in this issue of the Kepco Power Supply News, "The New KG Modular Power Supply", develops in detail the necessity for minimizing AC line leak - through and maximizing common mode rejection.

Translated into transformer terminology the critical parameters may be summarized as follows:

1. The effective input-to-output capacitance (C₁₂) is to be less than 1.0 pF.
2. Capacitance (C₂₂) between transformer secondary and ground is to be less than 100 pF, and the parallel leakage resistance (R₂₂) is to be much greater than 10,000 megohms.
3. Pickup of stray AC fields by the transformer secondary, or subsequent circuitry, is to be minimized.

This article will outline the techniques employed to realize the desired specifications.

Continued on Page 3 - Col. 1

SHOW VAN USED BY NACO ELECTRONICS CORP.

The NACO Electronics Corp., Kepco's upstate New York State sales representatives cover a great deal of territory with their sales demonstration van. This brings to Kepco customers first hand demonstrations and visual inspection of Kepco regulated power supplies. The following tells their story:

Continued on Page 5 - Col. 1

in this issue:

1. ISOLATED MODULAR POWER SUPPLY...
2. ISOLATION TRANSFORMATION...
3. SHOW VAN DEMONSTRATES APPLICATIONS...
4. NEW POWER SUPPLY ADDITIONS...
5. GLOSSARY OF POWER SUPPLY TERMS...
THE NEW "KG" ISOLATED MODULAR POWER SUPPLY

Continued from Page 1 - Col. 2

Tight regulation such as this is achieved through the use of new and improved circuits which maintain extremely close control of all critical voltages and currents internal to the unit. The all-silicon circuit includes four temperature-compensated zener diodes, all with operating currents rigidly pegged to their optimum values. High internal gain and high quality low noise circuit components reduce the residual output ripple and noise voltage to less than 100 microvolts rms.

A ten-turn locking voltage control, mounted on the front panel, provides a voltage adjustment resolution to better than 0.02% (5 millivolts). A very sharp current limit adjust, also accessible from the front, can be set to limit short-circuit currents as close as 20 ma above working load current, thus providing a high degree of protection for external circuitry. The current limit is not affected by accidental opening of the error sensing leads.

Output impedance is very low (6 milliohms at DC) and negligible at higher frequencies when compared to the impedance of the connecting wires usually necessary in measurements applications.

Error sensing terminals are provided to reduce the DC losses in the lead wires to virtually zero by including these leads in the feedback loop. Up to 0.5 volt drop per lead can be tolerated, with no voltage derating of the unit. In practice, this means each load wire can be 250 feet of # 20/AWG, or 620 feet of # 16/AWG, etc., at the full 200 ma output. At lighter loads, of course, longer wires or smaller gauges may be used. Clamping diodes are incorporated in the unit to limit voltage excursion if the error sensing leads are broken or inadvertently disconnected.

The very high values of isolation impedance achieved in this unit are made possible by careful selection of materials and components, plus the utmost care in circuit layout. The entire circuit is mounted on a glass laminate circuit board, with a nonmetallic front panel. All AC leads are separated as far as possible from sensitive DC control circuitry. The AC fuse is on the rear, mounted in the input transformer, so there are no AC leads whatsoever on the front panel. (There is no AC switch and the pilot lamp is AC operated.)

Of the component parts, the most severe requirements are imposed on the input transformer, supplied by Kepco Magnetics, Inc. The design considerations for this special transformer are described in detail elsewhere. The isolation capabilities of the Model KG 25-0.2 are closely linked to the characteristics of this component.

Applications for isolated or guarded DC power supplies range from field civil engineering, to the laboratories of medical electronics. In fact, such supplies find use in any branch of science or engineering where precise measurements, free from parasitic indications, are required.

Resistive bridge transducers especially require a clean, free-floating source of DC voltage; so do the free-floating amplifiers which boost their minute signals. Since the isolation of such an amplifier is no better than its power supply, the need for a well isolated source is obvious.

A simplified diagram for one typical application is shown in Figure 1. It shows a Model KG 25-0.2 connected as the energizing source for a strain gauge bridge. The transducer is shown grounded at its point of measurement (the usual case). The supply ground and AC line (earth) ground are shown separately in order to illustrate the fact that substantial potentials can and do exist between widely separated ground points. (A fact painfully evident to workers with microvolt signals.)

The stray impedances in the power supply, although actually distributed effects, are shown as lumped constants: Cx presents reactance to the line voltage equal to $\frac{1}{\omega C_x}$ in the transducer. The manner in which these impedances affect the transducer signal is as follows—worst case conditions being imposed throughout:

- $C_x = 1.0 \text{ pf}$
- $C_g = 200 \text{ pf}$
- $R_g = 10,000 \text{ megohms}$

$C_x$ presents reactance to the line voltage equal to $\frac{1}{\omega C_x}$.

The manner in which these impedances affect the transducer signal is as follows—worst case conditions being imposed throughout:

- $C_x = 1.0 \text{ pf}$
- $C_g = 200 \text{ pf}$
- $R_g = 10,000 \text{ megohms}$

$C_x$ presents reactance to the line voltage equal to $\frac{1}{\omega C_x}$.
At 60 Hz, this is
\[
\frac{1}{(6.28)(60)(2 \times 10^{-14})} = 2.65 \times 10^{18} \text{ ohms}
\]
For a 120 volt input, an AC leakage current of
\[
2.65 \times 10^{18} = 4.92 \times 10^{-10} \text{ amperes}
\]
will flow. This current, returning through a typical 350 ohm bridge, will generate a voltage equal to 
\[
(4.52 \times 10^{-10} \times 350) \text{ volts or 15.8 microvolts (rms)}
\]
This voltage, of course, will only appear in the transducer output as a percentage proportional to the bridge unbalance, e.g., with a 1% unbalance, the AC ripple or noise voltage attributable to \(C_x\) at the bridge output would be approximately 0.16 microvolt rms, or 0.45 microvolt peak-to-peak.

\(C_g\) offers a reactance to the common-mode voltage of \(E_2\) of
\[
\frac{1}{(6.28)(60)(2 \times 10^{-14})} = 1.33 \times 10^{18} \text{ ohms}
\]
The paralleled resistance, \(R_g\), of at least \(10^9\) ohms, being nearly three orders of magnitude greater, has a negligible effect on the absolute magnitude of the impedance. The ripple and noise introduced in the bridge output through this impedance by the common-mode voltage \(E_2\), of course, directly proportional to the magnitude of \(E_2\), but if we assume \(E_2\) to be 1.0 volt rms, then a current through \(C_g\) and \(R_g\) in parallel will be
\[
E_2 \frac{R_g}{R_g + C_g} = 1.0 \times \frac{1.33 \times 10^{18}}{1.33 \times 10^{18}} = 0.075 \text{ microamperes}
\]
This, across a 350 ohm bridge will generate
\[
7.5 \times 10^{-9} \times 3.5 \times 10^{-1} = 26.2 \text{ microvolts,}
\]
which will, again at a 1% unbalance, result in 0.26 microvolts rms or 0.74 microvolts peak-to-peak at the output.

The foregoing discussion points up the fact that high impedance to ground is of at least equal importance with output-to-line isolation. Too little emphasis is often placed on this, and some manufacturers neglect to specify this parameter.

The necessity for the tightest possible regulation and freedom from drift in the supply voltage of low-level transducers is too obvious to belabor. The Model KG 25-0.2 has been designed and developed with all of these requirements clearly in mind, and is representative of the present state of the art.

ISOlATION TRANSFORMER FOR STRAIN GAUGE POWER SUPPLIES

Continued from Page 1 - Col. 1

To gain some perspective into the nature of the problem, the characteristics of an ordinary transformer, such as the one used in a Kepco Model ABC Power Supply, may be used as a reference point. The effective input-to-output capacitance \((C_g')\) of such a transformer is of the order of 600 pf. The secondary-to-ground capacitance \((C_g')\) approximates 100 pf, and the insulation resistance may be as high as 400,000 megohms. However, the insulation resistance of most organic materials becomes halved for every 8°C increase in temperature. If such material is used in a transformer, the initial 400,000 megohm insulation resistance may decrease to as little as 100 megohms, at internal temperatures of 90°C (typical for a 50°C ambient rating).

A conventional transformer comprises a coil consisting of concentric primary and secondary windings. The mutual capacitance \((C_{xg})\) between these windings can be appreciated by reference to Figure 1.
It is apparent that a radical departure from conventional design is necessary to achieve the desired characteristics. Figure 2 is a semi-schematic representation of such an assembly, which has been adopted in the new Kepco Model KG Transducer Power Supply.

The salient features of this special transformer are as follows:

1. The primary and secondary coils are wound in two separate, narrow "pies", minimizing the areas over the core, and the areas facing each other. This minimizes the capacitance between windings as well as the capacitance to core.

2. The primary winding, including the fuse, is completely contained in its own electrostatic shield. This not only minimizes mutual capacitance, but virtually eliminates capacitance between the fuse, its wiring, and the output.

3. The secondary coil is liberally spaced from the primary winding, as well as the core and adjacent surfaces. This not only further attenuates the mutual capacitance, but reduces the secondary-to-ground capacitance.

4. In order to provide the necessary insulation resistance at 90°C (interior temperatures), nonorganic Teflon is used as the insulating medium. This material has superior insulation resistance, which it retains at elevated temperatures. Since its dielectric constant is rather high (~2.5), a shell construction is employed which supports the secondary coil at a minimum number of points. This leaves air (dielectric constant = 1.0) to fill most of the space.

5. The entire assembly is surrounded by a case which provides magnetic, as well as electrostatic, shielding, effectively reducing pickup of stray fields in the secondary coil.

6. The design of the transformer case and its terminals provide exceptionally short (pin) wiring from the various transformer windings to a printed circuit (PC) board. Short leads of approximately 1" are used to the AC connector giving complete separation of primary and secondary wiring. In addition, the location of the transformer on the power supply's main circuit board serves to enhance the shielding and isolation of the supply output.

Typical performance characteristics of the final production transformers are as follows:

- Effective input-to-output capacitance \((C_{xy})\): 0.03-0.08 pf.
- Effective secondary-to-ground capacitance \((C_{yg})\): 20-35 pf.
- Secondary-to-ground resistance \((R_g)\): 200 K - 250K megohms (at 90°C).

When installed in the power supply, with its own unavoidable capacitances and leakage paths, the required specifications are met with a comfortable margin of safety.

At Kepco, each magnetic component requirement is treated as an integral part of the circuit design problem, with the Circuit Design and Magnetic Design groups working closely together. Many unique solutions result from this ability to shape circuit performance by tailoring the electrical and mechanical characteristics of the magnetic components. The Kepco KG 25-0.2 Strain Gauge Power Supply is an outstanding example of the advantages to be gained from this integrated design approach.

**COMPLEMENTARY PROGRAMMING**

The use of PNP pass elements in the Kepco PAX module group, with NPN transistors used as the pass in PBX modules (their sister group), opens an area of interconnection hitherto not feasible. Operationally, PNP elements require a negative common with a positive output while, NPN elements result in a positive common terminal and negative output.

**NEW 52 PAGE 1966 KEPCO CATALOG**

Detailed specifications of more than 320 standard Kepco Regulated Power Supplies together with much useful power supply information are contained in Catalog B-663. Write for your copy to Kepco, Inc., Publications Dept., 131-38 Sanford Avenue, Flushing, N.Y. 11352.
Kepco's representative in Upstate New York, NACO Electronics, finished a very successful 2 month mobile demonstration van tour of the upstate area in December. The Mobile Demonstrator visited such facilities as IBM, GE, Sylvania, Bell Aeronautics, General Dynamics, Xerox, Westinghouse, Griffiss AFB, Univac and many colleges and universities located in the Upstate New York area. On board were many representative power supplies manufactured by Kepco, Inc. as well as products of other manufacturers they represent.

By using the remote programming capability of the Kepco power supplies, one demonstration explained the versatility of this programming capability by electronically varying the frequency of a Wavek generator as a function of this programmed voltage change.

Another demonstration illustrated the importance of remote error sensing at the power supply load. Without the Remote Error sensing capability of the Kepco power supplies, the voltage variation at the load would include the voltage drop in the long wire leads to the load. By the use of the error sensing capability, however, the load was effectively placed at the output terminals of the power supply electrically thus, in effect, eliminating any voltage drop from the power supply to the load. By switching the error sense leads in and out of the circuit, the load lead drop was observed on a DVM.

Still another demonstration showed the ability of a Kepco power supply to maintain a constant speed of a motor as the load on the motor was changed. In this demonstration a tachometer output was fed back to the power supply which in turn decreased or increased the output voltage from the supply in order to maintain a constant speed of the motor under a varying load.

Other demonstrations showed the versatility of the "VIX" (Automatic Voltage-Current Crossover) of the power supplies. In demonstrating this feature, a current limit control was set on the Kepco Model CK-8-5M with a constant load value (R). The voltage would be increased until the maximum current was reached. At this point, the power supply automatically changed to its constant current mode, and became a current regulated power supply. At the same time the "VIX" indicator lights showed the operator he was in the current mode rather than the voltage mode. The output of the VIX Indicators were then used to close a relay and actuate an alarm light. This also demonstrated the use of a power supply to control external devices in many industrial applications.

The range of output voltage available in the KS Design Group of Kepco voltage/current regulated power supplies has been doubled by the recent availability of the KS 120-1M, KS 120-2.5M, KS 120-5M and KS 120-10M models. These supplies with 0.005% line regulation and 0.01% load regulation combined with other important features of the KS series such as automatic voltage/current crossover, VIX signal mode indicators (which visually indicate whether the power supply is regulating in voltage or current mode), and 10 turn controls for both current and voltage make these new KS supplies an important addition to this outstanding design group engineered and manufactured by Kepco.
Supply News have become familiar with applications that have been evolved over the years. Beyond the classic job of powering other circuits, Power Supplies are increasingly finding application as instruments in their own right. This field has grown so in the past few years that we have undertaken to publish a Handbook covering the more interesting and useful power supply applications.

The Kepco Power Supply Handbook, written by Paul Birman, Kepco’s Application Engineer, covers the subject of regulated DC Power Supplies in detail. Particular emphasis is placed on the programming concept and its myriad applications to complex systems control problems.

Profusely illustrated with innumerable circuit diagrams, block diagrams and photographs, the Kepco Power Supply Handbook is a valuable addition to any engineering library. For a complimentary copy, contact your nearest Kepco representative or write on your company’s letterhead to: Publications Manager, Dept. K Kepco, Inc., 131-38 Sanford Avenue, Flushing, New York 11352.

Note: The response to the offer of the Kepco Power Supply Handbook is so great that we are repeating it this month for those who may have missed it.

THE KEPCO POWER SUPPLY HANDBOOK

Regular readers of the Kepco Power Supply News have become familiar with the many unconventional power supply applications that have been evolved over the years. Beyond the classic job of powering other circuits, Power Supplies are increasingly finding application as instruments in their own right. This field has grown so in the past few years that we have undertaken to publish a Handbook covering the more interesting and useful power supply applications.

The Kepco Power Supply Handbook, written by Paul Birman, Kepco’s Application Engineer, covers the subject of regulated DC Power Supplies in detail. Particular emphasis is placed on the programming concept and its myriad applications to complex systems control problems.

Profusely illustrated with innumerable circuit diagrams, block diagrams and photographs, the Kepco Power Supply Handbook is a valuable addition to any engineering library. For a complimentary copy, contact your nearest Kepco representative or write on your company’s letterhead to: Publications Manager, Dept. K Kepco, Inc., 131-38 Sanford Avenue, Flushing, New York 11352.

THE KEPCO POWER SUPPLY HANDBOOK

Note: The response to the offer of the Kepco Power Supply Handbook is so great that we are repeating it this month for those who may have missed it.

Regular readers of the Kepco Power Supply News have become familiar with the many unconventional power supply applications that have been evolved over the years. Beyond the classic job of powering other circuits, Power Supplies are increasingly finding application as instruments in their own right. This field has grown so in the past few years that we have undertaken to publish a Handbook covering the more interesting and useful power supply applications.

The Kepco Power Supply Handbook, written by Paul Birman, Kepco’s Application Engineer, covers the subject of regulated DC Power Supplies in detail. Particular emphasis is placed on the programming concept and its myriad applications to complex systems control problems.

Profusely illustrated with innumerable circuit diagrams, block diagrams and photographs, the Kepco Power Supply Handbook is a valuable addition to any engineering library. For a complimentary copy, contact your nearest Kepco representative or write on your company’s letterhead to: Publications Manager, Dept. K Kepco, Inc., 131-38 Sanford Avenue, Flushing, New York 11352.

THE KEPCO POWER SUPPLY HANDBOOK

Note: The response to the offer of the Kepco Power Supply Handbook is so great that we are repeating it this month for those who may have missed it.

Regular readers of the Kepco Power Supply News have become familiar with the many unconventional power supply applications that have been evolved over the years. Beyond the classic job of powering other circuits, Power Supplies are increasingly finding application as instruments in their own right. This field has grown so in the past few years that we have undertaken to publish a Handbook covering the more interesting and useful power supply applications.

The Kepco Power Supply Handbook, written by Paul Birman, Kepco’s Application Engineer, covers the subject of regulated DC Power Supplies in detail. Particular emphasis is placed on the programming concept and its myriad applications to complex systems control problems.

Profusely illustrated with innumerable circuit diagrams, block diagrams and photographs, the Kepco Power Supply Handbook is a valuable addition to any engineering library. For a complimentary copy, contact your nearest Kepco representative or write on your company’s letterhead to: Publications Manager, Dept. K Kepco, Inc., 131-38 Sanford Avenue, Flushing, New York 11352.

THE KEPCO POWER SUPPLY HANDBOOK

Note: The response to the offer of the Kepco Power Supply Handbook is so great that we are repeating it this month for those who may have missed it.

Regular readers of the Kepco Power Supply News have become familiar with the many unconventional power supply applications that have been evolved over the years. Beyond the classic job of powering other circuits, Power Supplies are increasingly finding application as instruments in their own right. This field has grown so in the past few years that we have undertaken to publish a Handbook covering the more interesting and useful power supply applications.

The Kepco Power Supply Handbook, written by Paul Birman, Kepco’s Application Engineer, covers the subject of regulated DC Power Supplies in detail. Particular emphasis is placed on the programming concept and its myriad applications to complex systems control problems.

Profusely illustrated with innumerable circuit diagrams, block diagrams and photographs, the Kepco Power Supply Handbook is a valuable addition to any engineering library. For a complimentary copy, contact your nearest Kepco representative or write on your company’s letterhead to: Publications Manager, Dept. K Kepco, Inc., 131-38 Sanford Avenue, Flushing, New York 11352.

THE KEPCO POWER SUPPLY HANDBOOK

Note: The response to the offer of the Kepco Power Supply Handbook is so great that we are repeating it this month for those who may have missed it.

Regular readers of the Kepco Power Supply News have become familiar with the many unconventional power supply applications that have been evolved over the years. Beyond the classic job of powering other circuits, Power Supplies are increasingly finding application as instruments in their own right. This field has grown so in the past few years that we have undertaken to publish a Handbook covering the more interesting and useful power supply applications.

The Kepco Power Supply Handbook, written by Paul Birman, Kepco’s Application Engineer, covers the subject of regulated DC Power Supplies in detail. Particular emphasis is placed on the programming concept and its myriad applications to complex systems control problems.

Profusely illustrated with innumerable circuit diagrams, block diagrams and photographs, the Kepco Power Supply Handbook is a valuable addition to any engineering library. For a complimentary copy, contact your nearest Kepco representative or write on your company’s letterhead to: Publications Manager, Dept. K Kepco, Inc., 131-38 Sanford Avenue, Flushing, New York 11352.

THE KEPCO POWER SUPPLY HANDBOOK

Note: The response to the offer of the Kepco Power Supply Handbook is so great that we are repeating it this month for those who may have missed it.

Regular readers of the Kepco Power Supply News have become familiar with the many unconventional power supply applications that have been evolved over the years. Beyond the classic job of powering other circuits, Power Supplies are increasingly finding application as instruments in their own right. This field has grown so in the past few years that we have undertaken to publish a Handbook covering the more interesting and useful power supply applications.

The Kepco Power Supply Handbook, written by Paul Birman, Kepco’s Application Engineer, covers the subject of regulated DC Power Supplies in detail. Particular emphasis is placed on the programming concept and its myriad applications to complex systems control problems.

Profusely illustrated with innumerable circuit diagrams, block diagrams and photographs, the Kepco Power Supply Handbook is a valuable addition to any engineering library. For a complimentary copy, contact your nearest Kepco representative or write on your company’s letterhead to: Publications Manager, Dept. K Kepco, Inc., 131-38 Sanford Avenue, Flushing, New York 11352.

THE KEPCO POWER SUPPLY HANDBOOK

Note: The response to the offer of the Kepco Power Supply Handbook is so great that we are repeating it this month for those who may have missed it.

Regular readers of the Kepco Power Supply News have become familiar with the many unconventional power supply applications that have been evolved over the years. Beyond the classic job of powering other circuits, Power Supplies are increasingly finding application as instruments in their own right. This field has grown so in the past few years that we have undertaken to publish a Handbook covering the more interesting and useful power supply applications.

The Kepco Power Supply Handbook, written by Paul Birman, Kepco’s Application Engineer, covers the subject of regulated DC Power Supplies in detail. Particular emphasis is placed on the programming concept and its myriad applications to complex systems control problems.

Profusely illustrated with innumerable circuit diagrams, block diagrams and photographs, the Kepco Power Supply Handbook is a valuable addition to any engineering library. For a complimentary copy, contact your nearest Kepco representative or write on your company’s letterhead to: Publications Manager, Dept. K Kepco, Inc., 131-38 Sanford Avenue, Flushing, New York 11352.

THE KEPCO POWER SUPPLY HANDBOOK

Note: The response to the offer of the Kepco Power Supply Handbook is so great that we are repeating it this month for those who may have missed it.

Regular readers of the Kepco Power Supply News have become familiar with the many unconventional power supply applications that have been evolved over the years. Beyond the classic job of powering other circuits, Power Supplies are increasingly finding application as instruments in their own right. This field has grown so in the past few years that we have undertaken to publish a Handbook covering the more interesting and useful power supply applications.

The Kepco Power Supply Handbook, written by Paul Birman, Kepco’s Application Engineer, covers the subject of regulated DC Power Supplies in detail. Particular emphasis is placed on the programming concept and its myriad applications to complex systems control problems.

Profusely illustrated with innumerable circuit diagrams, block diagrams and photographs, the Kepco Power Supply Handbook is a valuable addition to any engineering library. For a complimentary copy, contact your nearest Kepco representative or write on your company’s letterhead to: Publications Manager, Dept. K Kepco, Inc., 131-38 Sanford Avenue, Flushing, New York 11352.

THE KEPCO POWER SUPPLY HANDBOOK

Note: The response to the offer of the Kepco Power Supply Handbook is so great that we are repeating it this month for those who may have missed it.

Regular readers of the Kepco Power Supply News have become familiar with the many unconventional power supply applications that have been evolved over the years. Beyond the classic job of powering other circuits, Power Supplies are increasingly finding application as instruments in their own right. This field has grown so in the past few years that we have undertaken to publish a Handbook covering the more interesting and useful power supply applications.

The Kepco Power Supply Handbook, written by Paul Birman, Kepco’s Application Engineer, covers the subject of regulated DC Power Supplies in detail. Particular emphasis is placed on the programming concept and its myriad applications to complex systems control problems.

Profusely illustrated with innumerable circuit diagrams, block diagrams and photographs, the Kepco Power Supply Handbook is a valuable addition to any engineering library. For a complimentary copy, contact your nearest Kepco representative or write on your company’s letterhead to: Publications Manager, Dept. K Kepco, Inc., 131-38 Sanford Avenue, Flushing, New York 11352.

THE KEPCO POWER SUPPLY HANDBOOK

Note: The response to the offer of the Kepco Power Supply Handbook is so great that we are repeating it this month for those who may have missed it.

Regular readers of the Kepco Power Supply News have become familiar with the many unconventional power supply applications that have been evolved over the years. Beyond the classic job of powering other circuits, Power Supplies are increasingly finding application as instruments in their own right. This field has grown so in the past few years that we have undertaken to publish a Handbook covering the more interesting and useful power supply applications.

The Kepco Power Supply Handbook, written by Paul Birman, Kepco’s Application Engineer, covers the subject of regulated DC Power Supplies in detail. Particular emphasis is placed on the programming concept and its myriad applications to complex systems control problems.

Profusely illustrated with innumerable circuit diagrams, block diagrams and photographs, the Kepco Power Supply Handbook is a valuable addition to any engineering library. For a complimentary copy, contact your nearest Kepco representative or write on your company’s letterhead to: Publications Manager, Dept. K Kepco, Inc., 131-38 Sanford Avenue, Flushing, New York 11352.