PADvac Pad-mounted Automated Distribution Switchgear

DESCRIPTION

Cooper Power Systems Kearney™ PADvac is designed for cost-saving automated distribution schemes. With a strong emphasis towards distribution power quality, PADvac's automated designs reduce down-time by providing automatic service restoration. Advanced overcurrent protection schemes can greatly reduce operating costs.

Kearney Vacuum Switchgear has produced reliable and innovative distribution switching systems for three decades. The three-phase vacuum interrupter performs all switching and fault interruption. The vacuum interrupters are housed in a hermetically sealed enclosure and insulated with sulfur hexafluoride gas. This sealed design features exceptionally low maintenance as compared to gasketed SF6 switches, and oil or air insulated switchgear.

Vacuum interruption provides the highest obtainable switching duty cycle, making PADvac the ideal choice for automated switching systems. PADvac features the greatest application flexibility of any automated switchgear, offering six different remote switch operators to meet any automation requirement. The remote operators are configured to allow immediate hot stick manual operation.

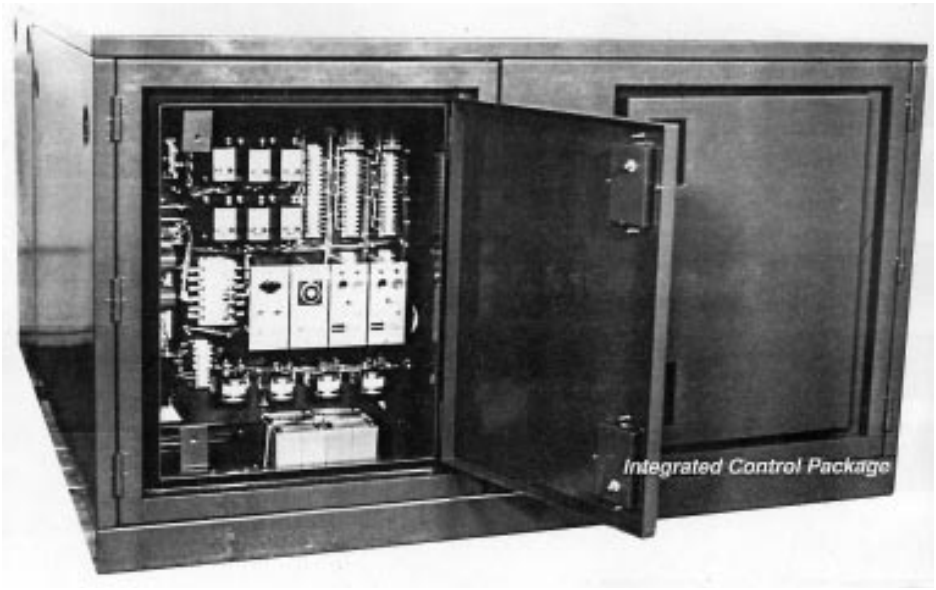

Figure 1.
PADvac integrated control package.

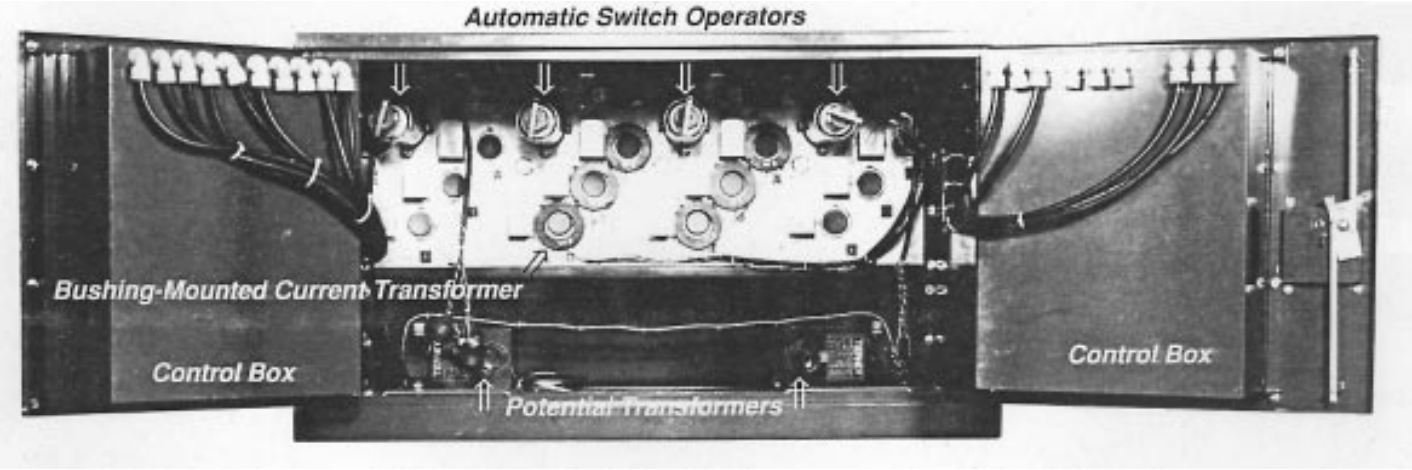

Figure 2.
Automatic switch operator.

Improve Power Quality While Reducing Down-Time and Operating Costs

- Distribution Automation
- Automatic Transfer Switch
- Fault Interruption
- FiLS
- Low Profile
- Single-Side Access
- Integrated Control Compartment
- Stainless Front Plate Construction
- Manual and Automatic Operation
- Deadfront Sealed Construction
- Vacuum Interruption, SF6 Insulation
- Standard Mild Steel Enclosure; Optional Stainless Steel or Fiberglass

Figure 3.
Dimensions for low-profile enclosure: 39" high x 67" wide x 71" deep.

Custom-Designed, Low-Profile Enclosure

PADvac's low profile enclosure was specifically designed for automated switching applications. The cabinet-style doors feature integrated control compartments. As with other Cooper Kearney switch designs, PADvac features single-side access to all controls, primary switches and cables. This allows interrogation of primary switches while operating the controls – important for ease of operation and safety. In addition, one-side access allows greater installation flexibility.

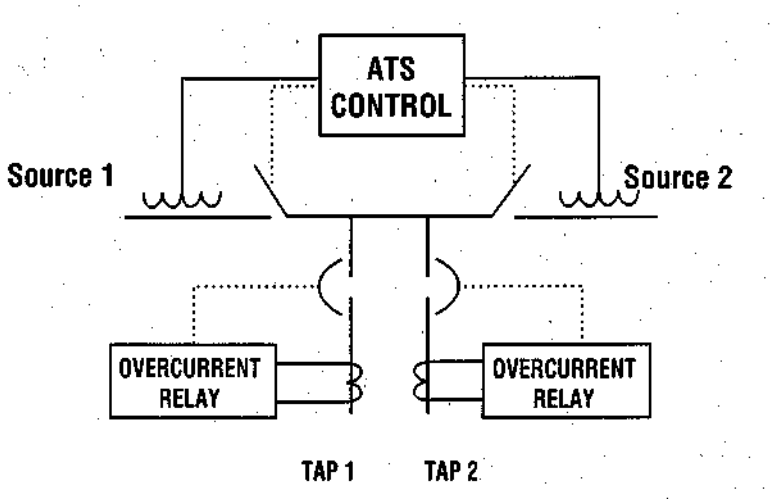

Figure 4.
Automatic fault interrupting switch.

Automatic Transfer Fault Interrupting Switch-ATFIS

Two of the more popular automation schemes are Auto-Source Transfer, and Auto-Fault Detection and Interrupting. The ATFIS combines both of these controls in one compact padmount switch that provides greatly enhanced power quality while reducing operating costs.

Automatic Transfer Scheme

The Automatic Transfer Scheme (ATS) controls the two source ways. PADvac is fed by two separate sources, and the three-phase voltage of each source is monitored by the ATS control. The Elbow Sensing Devices install on the source elbow test points. For improved power quality, the ATS provides automatic service restoration as follows:

- ATS automatically transfers to an alternate source if the preferred source loses power; the preferred source switch opens, then the alternate source switch closes. An adjustable transfer timer sets the delay time between loss of voltage and transfer.

- Automatically returns to preferred source once preferred voltage returns; return mode can be set for automatic or manual return. Return timer allows selectable delay for return.
- Return mode is selectable for closed transition—no interruption of power during return switching—or open transition to prevent the tying of two different substations.

Fault Interruption

Both PADvac taps feature Automatic Fault Interruption. By eliminating the cost of fuses and fuse replacements, operating costs can be significantly reduced. Fuse change-out time is eliminated, so system down-time is much less.

Bushing-mounted current transformers convey tap current to three-phase overcurrent relays. The relay simulates an “E” rated fuse Time-Current-Curve (TCC), allowing flexible overcurrent coordination. To eliminate field misadjustment, the relay is fixed at one trip setting and TCC. To change the trip setting, the relay can be easily removed, and replaced with a different size relay.

Resettable Fault Interrupter reduces operating costs by:

- Doubling as an open/close switch
- Providing a three-phase ganged trip that:
  - Protects critical three-phase loads
  - Eliminates ferroresonance problems
  - Prevents “single-phasing” of commercial loads
- Eliminating fusing expense:
  - No spare fuses to keep on trucks or in stock
  - Prevents installation of wrong size replacement fuse
- Reducing down-time for service restoration
- Visibly indicating a faulted tap

TABLE 1
Ratings

Voltage Class	15 kV	25 kV
BIL	95 kV	125 kV
Continuous Current	200 A/600A	200 A/600A
Momentary & Fault Close	20 kA (asym.)	20 kA (asym.)
Fault Interrupting Ways	20 kA (asym.)	20 kA (asym.)

Other PADvac Automation Systems

- Fault Interrupting Line Sectionalizer (FILS) consists of distribution switchgear equipped with FILS circuitry. Feeder faults are identified, the fault interrupted, bad line section isolated, and power restored, in less than 20 cycles. Eliminates system voltage “blips” that cause blinking VCR and microwave clocks.
- Generator Start Schemes are similar to the ATS system, but feature special provisions for an emergency generator as the alternate supply source.
- Distribution Automation (SCADA) Schemes: Always at the forefront of distribution automation, vacuum switchgear offers five different motor operator types to accommodate any SCADA requirement.
- Padmount Primary Network Protectors: Achieve enhanced reliability and safety for spot and grid network systems. A primary interrupter with automated control circuitry updates network system designs.

Contact your Cooper Power Systems representative for any specialty switchgear automation needs.

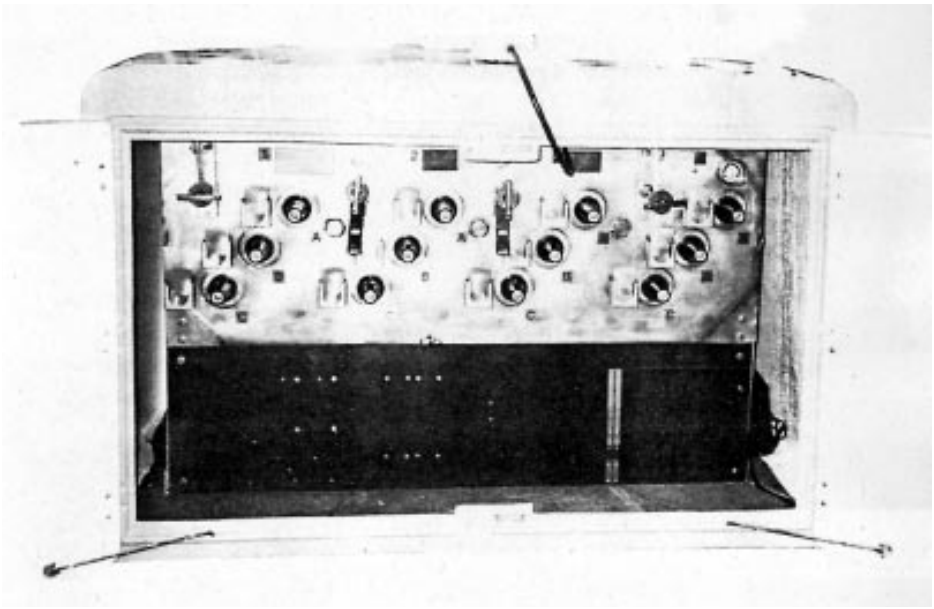

Figure 5.
PADvac in optional fiberglass enclosure.

COOPER Power Systems

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