

Case Study



Technology Applications

"Since the time that we have been shipping Falcon Electric's SG Series On-line UPS with our systems... the problems have vanished."

*– Keith Crandall, President
Crandall International*



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Falcon Helps Crandall International Customers Maintain a Steady Flow of Production

Crandall International is a manufacturer of precision packaging machinery for use in the food, chemical and petroleum industries. The company's highly accurate gravimetric filling machines can fill liquid containers as small as 500 milliliters, up to a 55 gallon (220 liter) drum or keg. The accuracy of the filling machines must be assured at all times to meet customer demands. Customer products include cosmetics, lotions, anti-freeze, lube oil and other liquids. The Crandall filling machines incorporate advanced microprocessor-based digital electronics connected to an ultra precise digital scale to assure the liquids are filled to the exact amount required.

Crandall's machines are sold to manufacturing customers around the globe. Some customers manufacturing plants are located in third world countries where power problems are a frequent daily event that cause havoc with sensitive equipment and electronic systems. To this point, the liquid filling machines rely on an electronic load cell with a digital indicator and a meter containing a micro-processor-based programmable logic controller (PLC) board. This PLC board, which requires a steady voltage source, is the "brain" of the filling system's weighing mechanism. Several years ago, when Keith Crandall, president, branched out to international customers, he started to experience many failures of the meter - about three out of every ten systems shipped - in third-world locations, such as Bangladesh. Customers in Ecuador and other Latin American countries were also experiencing malfunctions. Units operating in the U.S., Canada, Saudi Arabia, and other developed countries did not experience these failures.

These failures meant lost production for the customer that proved very costly. Aside from the approximate cost of \$2,000 to repair or replace the system's controller board, the real cost to the customer occurred when they had to stop all production while the machine was down, or resort to manually filling containers which proved prohibitively slow. From the time that the troubleshooting began, to the time that diagnosis was made and the replacement part was properly re-inserted, the customer was without use of the metered filling machine for several weeks.

After experiencing these types of failures, Crandall worked with Rice Lake Weighing Systems – the manufacturer of the metered filling systems – and determined that the failures were taking place in areas of the world that had a weak electrical infrastructure. "I remember sitting in an office in Nigeria and was concerned with the fact that while the afternoon heat wore on, the office lights were very dim. Then, without warning, the lights would turn very bright," said Crandall. "I asked what was going on and was told that a large consumer of electricity had just shut down for the day and that is why the power had jumped up to an over-voltage state. That was when I realized that the problem with the machines must be fluctuating voltages. At the same time, Rice Lake Weighing determined that voltage spikes were causing the failures. This was determined by the way the electronic boards inside the meter were burned out."

"Once it was clear that the problem was the AC power, I went to my battery supplier and asked them if they could help me. They directed me to Falcon Electric's line of rugged on-line uninterruptible power systems (UPS).

Precision Power Protection for Industrial Applications

They pointed out that Falcon Electric (www.falconups.com) offers professional-grade double conversion on-line UPSs and that this type of UPS is the only type that will proactively correct an under or over-voltage problem automatically. Falcon advised against using a cheaper, more rudimentary type of UPS with an off-line or line interactive design. These types of systems could help, but only by reacting to the under or over-voltage condition. After 4 to 30 milliseconds, the off-line and line-interactive UPSs change winding taps on an internal transformer in an attempt to grossly regulate (+8 to 12%) the polluted utility power. These designs would pass through many power related problems including high voltage transients, frequency shifts and short duration voltage dropouts directly through to the meter's sensitive electronics."

An on-line UPS creates new, clean power on a continuous basis, offering a much higher level of voltage regulation (+2 to 3%) and protection. In effect, the on-line UPS creates an "electronic firewall" between the incoming utility power and the sensitive equipment.

"Since the time that we have been shipping Falcon Electric's SG Series™ On-line UPS with our systems, or recommending a true on-line UPS, the problems have vanished. Our more sophisticated systems cost anywhere from \$30,000 to \$50,000. Customers rely on these systems to keep their production line moving – in essence to keep them in business. Downtime due to a failure of the weighing system is no longer an option and I am thrilled to have found Falcon Electric's SG Series UPS. We are preparing a unit that will be sent to Kazakhstan. I have peace of mind that power problems will not bring the filling system down since the unit will be shipped with a Falcon Electric UPS."



SG Series™ 800VA - 6kVA On-line UPS

Advanced Features:

- True Double Conversion On-Line, Sinewave Design
- Input Power Factor Correction
- Wide Input Voltage Window
- Precision Output Voltage Regulation
- Superior Brownout, Surge and Transient Protection
- Internal System Bypass
- Eliminates Generator Frequency & Voltage Drift
- UPSILON® Monitoring & Shutdown Software
- Optional Frequency Conversion
- Optional Extended Battery Packs & Chargers
- Optional Internal SNMP/HTTP Interface Card
- Two-Year Warranty

