Success Story:
Titan International Sales

Market Served
Manufacturing and Industrial

Eaton solves electrical failures for automotive OEM

Location:
Burnsville, Minnesota

Challenge:
Eliminate high-speed line noise and transient events causing intermittent equipment problems

Solution:
Expert electrical system analysis leading to the application of Eaton® Innovative Technology™ Equalizer and CF Series surge protection devices

Results:
Eaton helped reduce annual service call costs of more than $35,000 related to poor power quality

"The addition of the Eaton protection equipment on our CNC drilling machines has allowed us to focus more on our core business and has reduced service calls for us and downtime for our customers. Plus, we estimate that the reduction in warranty claims could save more than $50,000 per year in time, flights and replacement parts."

Paul Sciarratta, President,
Titan International Sales

Background

Titan International Sales (Titan) is a leading supplier of electrical discharge machining equipment, which supports precision small hole drilling. Titan's computer numerical controlled (CNC) electrical discharge machining equipment is used to produce high accuracy original equipment parts for a major customer in the motorcycle and automotive industries.

When Titan's critical CNC equipment began to perform erratically, its customer had to regularly scrap expensive materials and fell behind on production schedules.

Titan's service engineer had been to the original equipment manufacturer (OEM) customer site in Burnsville, Minnesota, multiple times to troubleshoot the issue. The service engineer was not able to isolate the problem, but suggested that voltage fluctuations or other power quality issues may be the root cause. The local utility company and Eaton were brought in to monitor the shop's service entrance and the 208-volt panelboard feeding the CNC drilling machine.

Challenge

The CNC electrical discharge machining manufacturing process uses electrical discharges—or sparks—to obtain a desired shape in hard metals and materials. Better known as spark machining, spark eroding, burning or die sinking, these wire-cutting machining methods are often the only way to cut, punch, tool or die especially hard metals like steel and carbon fiber.

To achieve accuracy in cutting the most intricate tapering and transitioning shapes, electrical discharge machining wires are spooled between diamond guides that use CNC plotters to interpret master drawings. Due to the electrical interdependencies of the CNC small hole drill machine, it was especially difficult to identify the cause of the machine's intermittent operation.

Eaton identified specific power quality anomalies, including high-frequency line noise and low-level transient events as the root cause. To solve the issue and prevent Titan from incurring further costs, Eaton recommended that the end customer replace existing inferior surge protection products with its more durable and precise Innovative Technology (IT) surge protection solutions.

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Studies have shown that failure to protect sensitive electronic loads costs American manufacturing, commercial and service industries more than $39 billion per year in lost time and revenue. Preventing these losses is a major cost-saving opportunity.

Eaton's analysis of the electrical system monitoring emphasized the need for IEEE's cascaded approach to surge protection. Since 80 percent of transients are created internal to a typical manufacturing facility, the cascaded protection solution provides two levels of surge and noise mitigation to protect the microprocessor power supply from false data signals or damaging high speed transients.

Solution

Titan implemented Eaton's IT filtering and surge protection products for a higher level of suppression, reliability and performance.

To protect the critical machinery, Titan installed Eaton's IT Critical Filter (CF) Series noise filtering and surge suppression product. The CF Series offers superior, series connected surge protection and excellent filtering of electromagnetic interference (EMI) and radio frequency interference (RFI). This is also referred to as a hybrid device, using metal oxide varistors (MOV) for protection against damaging transients and tuned filter capacitors to attenuate the EMI line noise.

In prior attempts to solve the issue, Titan had used lower performance surge protective devices that did not have filtering. This yielded unsatisfactory results.

The team also recommended the IT System Shield multi-stage approach to surge mitigation, per the IEEE cascaded approach. The Eaton IT Equalizer Series was installed for additional surge and noise protection upstream at the electrical distribution panelboard feeding the critical machinery. The equalizer's threshold response network affords redundant MOV and peak surge current that suppresses high-energy impulse transients and provides robust protection. The product's active tracking network (ATN) and EMI/RFI filter further suppress ringing transients within nanoseconds and filters any detected line noise.

No matter where transients originate, IEEE's cascaded approach using in-line filtering and parallel connected panelboard surge protection safeguards against the full spectrum of transient disturbances by filtering the entire sine wave. High quality noise filtering in the IT CF and Equalizer Series products reduce or eliminate line noise and mild ringing transients, providing customers with advanced protection. Plus, Eaton's IT line filters and surge protectors are specifically designed to protect sensitive electronics from hazards that exist within industrial and manufacturing facilities.

Results

Titan's president, Paul Sciarratta, reports that since the installation of the Eaton IT products at its customer location, the CNC small hole drill machine has worked flawlessly. "The addition of the Eaton protection equipment on our CNC drilling machines has allowed us to focus more on our core business and has reduced service calls for us and downtime for our customers."

Studies have shown that failure to protect sensitive electronic loads costs American manufacturing, commercial and service industries more than $39 billion per year in lost time and revenue. Programmable logic controller (PLC) manufacturers and service technicians recommend the use of power line filters and surge protective devices to prevent downtime and equipment damage due to electrical surges and line noise. Preventing these losses is a major cost-saving opportunity.

Based on the successful resolution of power quality issues in the machinery shop and the strong performance of Eaton's solutions, Titan reports that it plans to install Eaton's IT System Shield solution at customer locations throughout North and South America.

Titan estimates that the reduction in warranty claims could save the company more than $50,000 per year in time, flights and replacement parts. More importantly, Titan expects customer satisfaction and reliability of their machines to increase regardless of the quality of power present at any customer site.

For technical assistance with IT surge applications, contact the Eaton Technical Resource Center:
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