

Case Study: NIDEC Control Techniques Drive Unit Repair



Quad Plus®



National tire manufacturer reports NIDEC Control Techniques drive unit faulting under input phase loss.

Objective

- Repair NIDEC Control Techniques drive unit

Solutions

- Performed preliminary static test.
- Confirmed a shorted SCR on L1 input in reference to the DC bus line.
- Recommended replacement of all SCRs as a precautionary measure due to additional electrical and heat stress.
- Replaced all SCRs with new ones to continue analysis.
- Operated the drive under load at nominal amperage to fully test the drive unit.
- Advised the customer to continue using recommended fuses for their system to avoid future damage to the system.

Results/Benefits

- The customer's operations were returned to normal capacity.
- Additional downtime and complications were avoided by replacing all SCRs.

Background

The Quad Plus team received a call from a large, national tire manufacturer reporting problems with their Control Techniques Unit drive SP4401 unit. The customer stated that the unit was continually blowing incoming fuses; the drive unit was faulting under input phase loss.

The unit was still supported by Control Techniques, and the open fuses prevented further damage to the unit and any surrounding areas. Still, as a result of the faulting fuses, the facility's operations were brought to a halt until the problem could be resolved.

Quad Plus Solution

The first step was the preliminary static test to check for any obvious shorts or opens in the converter and inverter side of the motor drive unit. The defective component, a shorted SCR on L1 input in reference to the DC bus line, was identified and replaced. We also recommended that the other two SCRs be replaced as a precautionary measure. The failed SCR had caused electrical and heat stress to the remaining SCRs, and replacement would avoid another failure and additional downtime.

Once all three SCRs were replaced, the drive was operated under load at nominal amperage to fully test the drive unit and

confirm that the repair was successful. We also advised the customer to continue using the recommended fuses for their system. Replacing the fuses with a higher amp fuse cause concern as they act as the weak link in the circuit, and a higher current can cause catastrophic damage to the system.

