

Collaboration Delivers High Profile Innovative Solution



Result

- Emerson and Tekgard's teamwork, open communication and collaboration, along with Emerson's resources and expertise, enabled them to identify a solution in less than two weeks
- A decrease in product and material loss within the compressed timeframe
- The affected unit was retrofitted quickly, meeting the needs of the U.S. Army

Application

Tekgard exclusively uses Copeland™ fixed and digital scroll compressors in their military applications. They partner with Emerson because of the broad range of Copeland product offerings in addition to an exceptional industry reputation. They also wanted a company they knew they could trust and would enhance their credibility.

Challenge

With their end user being the U.S. Army, Tekgard manufactures and provides ECU's (Environmental Control Units) for military applications that endure rigorous qualification testing to ensure full compliance of military standards and specifications including severe shock and vibration requirements as well as significant collision impacts. These units must meet these requirements due to being faced with both harsh natural and manmade environments on a regular basis. In addition, they must be able to sustain numerous transportation methods including air transportation that need to withstand hard impact landings, railcar impact collisions during coupling which involves significant vibrations, sudden and unexpected jarring, additionally, they must survive severe conditions where the HMMWV (High Mobility Multipurpose Wheeled Vehicle) are subjected to extreme terrains and environments.

Because of all these factors, when unloader valve tubing started cracking on a new model, Tekgard knew this was a critical challenge that needed to be solved in a timely manner.

COPELAND™

“ This is the first time that we have made this type of request and we were blown away by Emerson's support! ”

– Matt Keller,
General Manager of Tekgard

**TEKGARD**

**EMERSON™**

These breakages started occurring when they made the switch from the R407C digital compressors to the R-410A single phase digital compressors. The change in compressor along with the mounting configuration for the mobile application resulted in a harmonic resonance that was causing vibration of the unloader valve. The vibration was fatiguing and breaking tubing on the bottom of the unloader valve near the suction line connection.

Solution

Although the issue was not being caused by Copeland compressors, Tekgard contacted Emerson with the intent to collaborate, share data, and identify the root cause of the problem. Subsequently, Tekgard shipped their ECU to Sidney, Ohio labs to troubleshoot and identify a solution. With Emerson’s expertise and assets on hand, including new state-of-the-art labs, equipment and electronics and vibration harmonics, the Applied Mechanics group was able to pinpoint the issue and confirm the effectiveness of a proposed unloader valve bracket. This quick collaboration resulted in a design improvement and retrofit to restore the reliability of these ECU’s.



New HVACR technology labs in Sidney, Ohio enable advanced testing for future innovations

200K+

square feet of labs, testing and engineering

2M

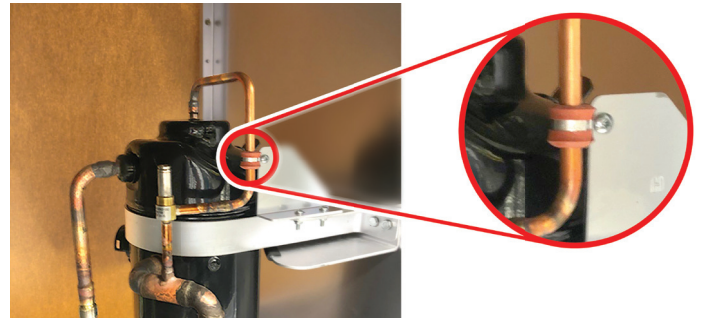
cumulative test hours per year

500

compressor test stands and testing chambers

400

engineers and researchers



Tekgard H42-T104-C Environmental Control Unit



Copeland™ ZPD54K5E-PFV-130 digital scroll compressor

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