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CASE STUDY: COMBATING EMC CHALLENGES IN LABORATORY SYSTEMS

AT A GLANCE Requirements

- Meet CISPR 11 conducted emissions
- Identify whether the noise was common mode or differential mode
- Quick turn-around time to meet product launch goals
- Limited space availability
- Safety approval for a mod standard solution

Benefits

- Tailor our MOD-Std products to meet the unique needs of our customers
- Optimized the X-cap to strike the perfect balance between size and performance
- Conducted UL1283 and IEC 60939 testing at our in-house safety lab within an 8-week timeframe
- Tailor our MOD-Std products to meet the unique needs of our customers



OVERVIEW

Laboratory equipment needs to have low electrical emissions in order to ensure accurate and reliable results. This is particularly important for instruments like centrifuges, which are commonly found in both clinical and research labs. Centrifuges are essential for separating particles based on density in fluids, gases, or liquids. However, the functionality of these instruments can be compromised if there are high levels of electrical interference. By effectively reducing conducted emissions, this filter solution ensures that the equipment operates at its optimal level, delivering accurate results every time.

POWER CHALLENGES

During our collaboration with a lab centrifuge manufacturer, our team encountered a range of obstacles. We had to address the CISPR 11 conducted emissions requirements and found that no standard component could resolve the issue of low-frequency failure. Additionally, the nature of the noise, whether it was common mode or differential mode, was unclear, posing a challenge in designing a solution. The limited space available further complicated matters, ruling out a longer dual-stage filter as a viable option. Lastly, obtaining safety approval for a custom solution added an extra layer of importance to our work.

ASTRODYNE TDI'S SOLUTION

We shifted our focus to increasing the differential mode insertion loss by making adjustments to the X-cap. Given the limited space available, we carefully optimized the X-cap to strike the perfect balance between size and performance. It is important to note that this change in the X-cap resulted in the voiding of agency approvals. To rectify this, we conducted UL1283 and IEC 60939 testing at our in-house safety lab, and within a remarkable 8week timeframe, we obtained new certifications.