KOLLMORGEN
A REGAL REXNORD BRAND

SUCCESS STORY

Hazardous location servo motors for freeze dryer applications

With the rapid development of factory automation, application scenarios for lyophilizers (vacuum freeze dryers) have become more and more extensive. To cope with the evolving automation needs and the special requirements of different application environments, freeze dryer equipment manufacturers need to continuously upgrade their equipment.

Challenge

Intelligent technology brings ever-greater degrees of automation to factories. In these highly automated settings, the feeding and discharging system of the vacuum freeze dryer is integrated into the total automation system. As the portal into the freeze dryer, the heavy and flexible dryer hatch needs to run smoothly and precisely to the specified position, requiring extremely accurate servo motors to execute the switching action.

Lyophilizers play a pivotal role in pharmaceutical manufacturing. In these production environments, due to the volatilization of certain powders and liquids, combustible dusts can form and accumulate, creating a safety hazard. Isolation systems and clean engineering practices can mitigate these hazards, but there is still a possibility that hazardous dusts will be present for periods of time in sufficient quantities to create a risk of explosion.

Freeze dryer motion control systems must be designed with hazardous location protection to prevent the ignition of dusts accumulated on equipment or suspended in the atmosphere.

Vacuum freeze dryers, or lyophilizers, are mainly composed of two parts: a refrigeration system and a vacuum system. A water containing material is frozen to the eutectic point so that the moisture in the material becomes solid ice. Then, in a higher-vacuum environment, heating sublimates the ice directly into the water vapor without liquefying. This water vapor is condensed and removed, with desorption leaving the material in a dehydrated state. This process is widely used in pharmaceutical, chemical, food and other industries.

Solution

Kollmorgen's motion control experts recommend the AKME hazardous location servo motor with ATEX certification paired with the AKD servo drive as a high-performance solution for eliminating the risk of explosion in automation environments occasionally exposed to hazardous gases or dusts.

The AKME series features a compact size, high output torque, stable performance and standard modifications that enable custom-like versatility. These advantages make AKME motors an ideal platform for high-precision automation of the lyophilizer door. The modified version featuring a double output shaft can smoothly and accurately operate the heavy but flexible vacuum freeze dryer hatch to the specified precise position. And ATEX and IECEx certifications help ensure that the freeze dryer can operate safely in an environment potentially exposed to ignitable dusts.

The AKME motor is optimally paired with the high-performance AKD servo drive, which includes the proven WorkBench™ parametrization and commissioning tool to quickly adjust parameters for fast, convenient control. WorkBench™ also provides real-time drive output status to optimize motion sequences and maximize machine performance.

Results

Using AKME hazardous location motors, customers gain high servo performance along with certifications for use in explosive atmospheres in gas Zone 2 and dust Zone 22 locations. Paired with the powerful and comprehensive functions of the Kollmorgen AKD servo drive, this solution helps customers optimize automation equipment, reduce power consumption and improve efficiency to achieve a distinct advantage in a fiercely competitive market.

About Kollmorgen

Kollmorgen, a Regal Rexnord Brand, has more than 100 years of motion experience, proven in the industry's highest-performing, most reliable motors, drives, AGV control solutions and automation platforms. We deliver breakthrough solutions that are unmatched in performance, reliability and ease of use, giving machine builders an irrefutable marketplace advantage.

KM_SS_000452_RevA_EN