GORE® Protective Vents
Case History

INCREASE SERVICE LIFE OF SOLAR TRACKING SYSTEMS BY EQUALIZING PRESSURE

Together, improving life

Situation

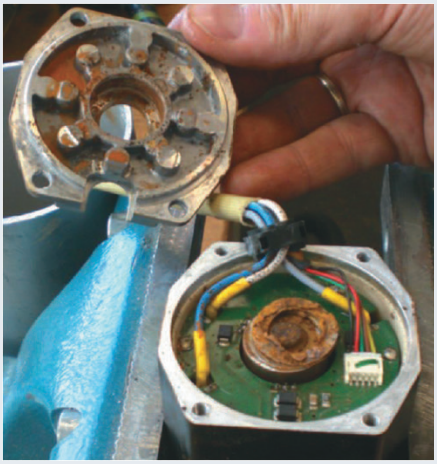
Dunkermotoren, a global manufacturer with operations in Germany, the United States and China, provides solar tracking solutions that are installed worldwide. This equipment combines a DC or brushless DC (BLDC) motor, integrated electronics and gearbox to track the sun's location for photovoltaic, concentrated photovoltaic and concentrated solar power systems. These systems are installed in locations that experience extreme weather conditions such as long hours of direct sunlight, wide temperature ranges, high winds, dust, hail and driving rain. Therefore, the electronics and motors must be protected against these environmental conditions to ensure reliable performance for the systems' expected service life.

Dunkermotoren engineered a sealed housing with O-rings and connector seals to protect its motor components from liquid and contaminant ingress; however, the motors were experiencing corrosion issues once installed in the field. These issues increased customer returns and warranty claims. When developing their new STM™ system, they focused on improving the motor's durability to meet the intended service life and increase customer satisfaction.

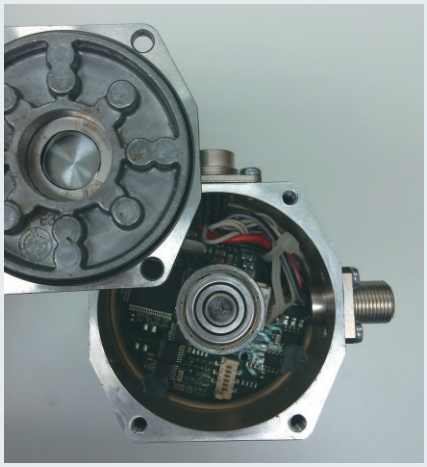
"GORE® Protective Vents extend the life of our motors by achieving the durability of IP67 protection against exposure to harsh environments. Gore's engineers understood our requirements and worked like part of our team to ensure that our products deliver the performance our customers expect."

Challenge

The exposure to the direct sun during the day and cool temperatures at night causes significant temperature changes outside the housing. In addition, a sudden rainstorm on a hot sunny day can result in the temperature dropping rapidly. In an enclosure designed to be completely sealed, these changes can cause significant pressure differentials inside the housing, which can create in a vacuum that puts stress on the housing seals. Over time, this fatigue can lead to failures — creating leak paths for liquid and particulate contaminants. However, providing an opening to allow the housing to release pressure (in other words, breathe) creates a known leak path. Therefore, this opening would need some level of protection. For the new design, Dunkermotoren's engineering team decided to test various venting options to eliminate potential seal failure due to pressure differentials.



Before vent installation



After vent installation

Available in a variety of designs, sizes and product forms, GORE® Protective Vents equalize pressure, prevent contamination and reduce condensation in a variety of applications. The GORE® Metal Vent is ideal for Dunkermotoren's BLDC motor because of its added durability.

Solution

Based on feedback from their customers, the engineering team decided to evaluate GORE® Protective Vents. Gore's application engineers collaborated with the Dunkermotoren engineers to evaluate several GORE® Protective Vents in both environmental chamber tests and field tests. Based on the results of these tests and the need to integrate the vent into an existing product design, Gore recommended a GORE® Metal Vent. This vent equalizes pressure within the motor by maintaining sufficient airflow to allow air and moisture vapor to pass in and out of the enclosure freely. At the same time, the vent serves as a barrier to provide a high level of ingress protection (IP*) against liquid, dirt, dust, salt and other contaminants. The rugged screw-in construction of GORE® Metal Vents extends the system's service life and is easy to integrate into new or existing product designs.

According to Will Vinson, President of Dunkermotoren USA, Inc., a division of AMETEK Precision Motion Control, their goal was to develop a more durable product to exceed service-life expectations. "With our new STM™ product, we wanted to deliver a tracking system that would last for the expected life of the solar energy system — more than 20 years. GORE® Protective Vents extended the life of our motors by achieving the durability of IP67 protection against exposure to harsh environments. Gore's engineers understood our requirements and worked like part of our team to ensure that our products deliver the performance our customers expect."

Diverse Product Line Engineered for Simple Integration

GORE® Protective Vents are manufactured in many different sizes and shapes, making it easy to choose the optimal vent to meet the design and performance requirements of a specific application. The versatility of GORE® Protective Vents is apparent in both their range of protection and their ease of installation. For example, these vents:

- Tolerate temperatures ranging from –40°C to 150°C
- Can meet protection standards up to IP69K
- Install easily by being adhered, threaded, snapped or heat/ultrasonic-welded to a variety of enclosure materials

About Gore

W. L. Gore & Associates is a global materials science company dedicated to transforming industries and improving lives. Since 1958, Gore has solved complex technical challenges in demanding environments — from outer space to the world's highest peaks to the inner workings of the human body. With more than 11,000 Associates and a strong, team-oriented culture, Gore generates annual revenues of $3.8 billion.

Gore develops products and technologies that address complex product and process challenges in a variety of markets and industries, including aerospace, automotive, pharmaceutical, mobile electronics and more. Through close collaboration with industry leaders across the globe, Gore enables customers to design their products and processes to be safer, cleaner, more productive, reliable, durable and efficient across a wide range of demanding environments.

Learn more at gore.com/protectivevents.

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