



MILLER PARK

Making The Rain Go Away At Miller Park
With Nook Electric Cylinders

As the world's leading authority on large-scale motion technology, Uni-Systems was a natural choice for solving a persistent water problem at Miller Park, the new home stadium of the Milwaukee Brewers in Milwaukee, Wisconsin. Miller Park, which opened at the beginning of the 2001 baseball season, features a retractable roof that opens to provide a panoramic view of the Milwaukee skyline. Opening the roof involves rotating five massive pie-shaped panels around five individual pivots. During stormy weather, the roof leaked in the outfield area, prompting the Southeast Wisconsin Professional Baseball Park District, which owns Miller Park, to search for a consultant to stop the leaks.



(Above) Uni-Systems utilized actuators from Nook Industries to solve a persistent water problem at Miller Park, the new home stadium of the Milwaukee Brewers.

With extensive experience in the motion of large structures and weather-sealing methods, Uni-Systems was chosen to solve the water leakage problem. The solution Uni-Systems developed included a combination of installing seals on the large existing panels and adding four additional six-foot-by-20-foot doors, according to John Lanari, project manager for the Miller Park project at Uni-Systems.

"Controlling the movement of the new six-foot-by-20-foot doors — how they are actuated — became a critical design factor for implementing our solution," Lanari explains. "These doors weigh 1,500 pounds each, and we needed to move them a substantial distance under unique loading conditions."

After evaluating actuators from four different manufacturers, Uni-Systems selected Series DD-100 electric cylinders from Nook Industries to control the movement of the large, metal, seal doors. Lanari says the company chose Nook actuators because they provided a long stroke (60 inches of travel) under heavy load, a relatively fast travel speed of 36 inches/minute, the strength to withstand heavy wind and storm loads, the ability to move heavy loads despite power limitations, and the best price.

Closing 1,500-Pound Doors

Using Nook electric cylinder actuators, Uni-Systems designed a system that completely seals Miller Park from the elements, allowing for game play and other events during inclement weather. The Nook actuators move each of the four 1,500-pound seal doors into position when the roof is opened or closed. Lanari says the relatively long stroke of 60 inches coupled with heavy loads and power limitations presented unique actuation challenges.

- Achieved a long stroke with heavy loads.
- Moved heavy loads with 1½ HP motor.
- Overcame high wind, storm loads.
- Provided an effective solution.

Uni-Systems, the world's leading authority on large-scale motion technology, needed an affordable, effective solution for controlling the movements of four large doors, which were part of the firm's solution for sealing leaks in the retractable roof at Miller Park.

"Anybody can supply an electric cylinder at any cost," Lanari notes. "But to supply the actuation we needed — the ability to sustain substantial physical and potential storm loads — at the cost point we needed was impressive. It was an important factor that helped us to succeed on this project."

“We had constraints on several fronts,” Lanari explains. “Our budget was limited, we had to move heavy metal frame doors a significant distance, and we were somewhat limited on the size of the motor we could put up there. We ended up using a 1½ HP motor with the Nook electric cylinders.”

Withstanding High Wind Loads

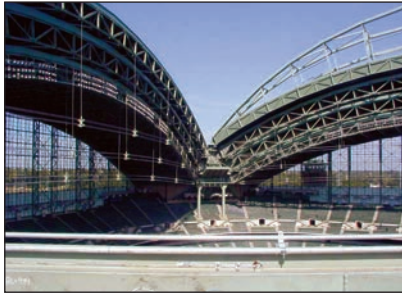
In addition to handling the loads associated with the doors themselves, the actuators had to be able to withstand high wind loads. Lanari says project specifications called for a system that could sustain a 50-year storm without failure, complicating the load demands on the actuator even further.

“A 50-year storm would produce a load on the door of 55 pounds per square foot,” Lanari says. “When you’re working with a very long actuator with very high loading on the actuator itself, you need to size the thing to handle substantial loads while still coming in under budget. The Nook actuator was the best solution under these conditions.”

An Affordable, Effective Actuation Solution

Having worked with Nook linear motion control components and systems in the past, Lanari says he was not surprised that Nook offered the most affordable and effective actuation solution for the Miller Park project.

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(Above) Uni-Systems selected Series DD-100 electric cylinders from Nook Industries to control the movement of the stadium roof's 1,500-pound, metal seal doors.



Uni-Systems

Founded in 1968, Uni-Systems is the world's leading authority on large-scale motion technology. From its early work in aircraft hangar door automation, Uni-Systems has expanded the application of its expertise to provide innovative solutions for facilitating transformative movement in large structures. Today, much of the company's business focus is on the development of multi-fleet aircraft maintenance systems and mechanisms for moving large structures, such as the retractable roofs used in many stadiums. Based in Minneapolis, Minnesota, Uni-Systems relies on its staff of pioneering thinkers — architects; electrical, mechanical, and structural engineers; project managers; and field operations professionals — to provide superior solutions to complex problems.



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